UNIVERSITY OF SANTA CLARA

CATALOGUE . . . 1949-1950

ANNOUNCEMENTS FOR THE CENTENNIAL YEAR 1950-51

University of Santa Clara

COLLEGE OF ARTS AND SCIENCES

This College offers major courses in the Departments of Economics, English, History, Philosophy, Political Science, Biology and Chemistry leading to the Bachelor's degree.

Courses in the College of Arts and Sciences are approved by the American Medical Association for entrance to medical school.

COLLEGE OF BUSINESS ADMINISTRATION

A four-year course leading to the degree of Bachelor of Science in Commerce.

Evening Division: Selected courses in Business Administration offered for college credit but leading to no degree.

COLLEGE OF ENGINEERING

Four and five-year courses in Civil, Electrical and Mechanical Engineering.

Accredited by the Engineering Council for Professional Development.

COLLEGE OF LAW

A three-year full time day law course leading to the degree of Bachelor of Laws, following three years' pre-legal work in the College of Arts and Sciences.

Approved by the American Bar Association.

Member Association of American Law Schools.

For Catalogue of the University

Address

The Registrar

University of Santa Clara, Santa Clara, California

Map of the

UNIVERSITY OF SANTA CLARA

MARCH, 1950

University of Santa Clara

COLLEGE OF ARTS AND SCIENCES

This College offers major courses in the Departments of Economics, English, History, Philosophy, Political Science, Biology and Chemistry leading to the Bachelor's degree.

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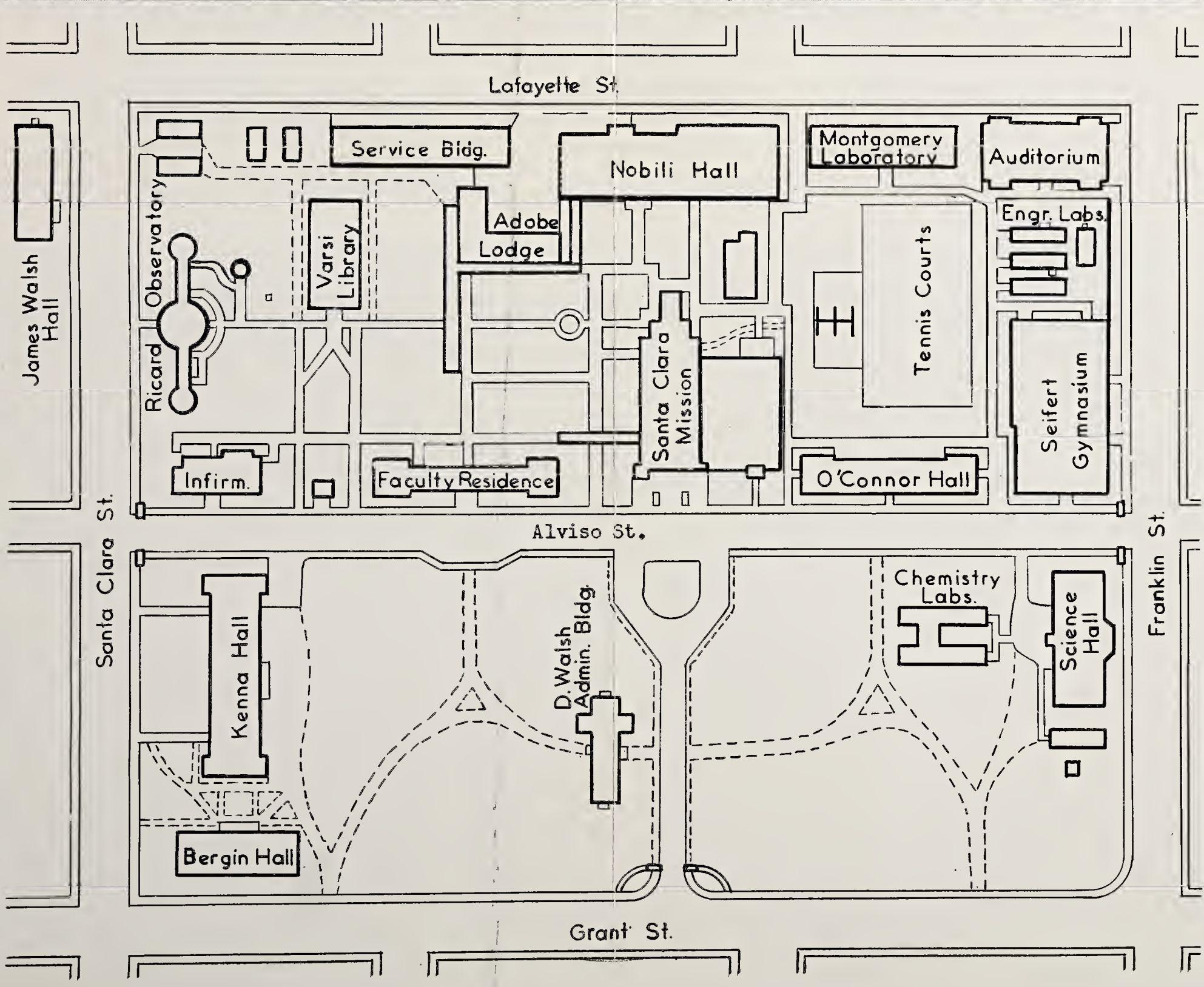
The Registrar

University of Santa Clara, Santa Clara, California


Lafayette St.
Service Bldg.
Nobili Hall
Montgomery Laboratory
Auditorium
Observatory
Varsi Library
Adobe Lodge
Engr. Labs.
Tennis Courts
James Walsh Hall
Ricard
Santa Clara Mission
Seifert Gymnasium
Infirm.
Faculty Residence
O'Connor Hall
Alviso St.
Santa Clara St.
Franklin St.
Kenna Hall
D. Walsh Admin. Bldg.
Chemistry Labs.
Science Hall
Bergin Hall
Grant St.

To mould men after the model of the Man-God, and thus form them to serve their fellowmen, their country and their God; this is the ideal and the purpose of the University of Santa Clara.

University of Santa Clara

CATALOGUE

FOR THE NINETY-NINTH YEAR

1949 - 1950

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ANNOUNCEMENTS, 1950 - 1951

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Member National Catholic Educational Association
Member Jesuit Educational Association
Member Northwest Association of Secondary and Higher Schools
Member Western College Association
Member American Council on Education
Member Association of American Colleges
Accredited by Engineering Council for Professional Development
Approved by the American Bar Association
Member Association of American Law Schools
Approved by the American Medical Association

•

PUBLISHED ANNUALLY DURING MARCH BY
THE UNIVERSITY OF SANTA CLARA
SANTA CLARA, CALIFORNIA

MARCH, 1950

The Corporate Title of the University is

PRESIDENT AND BOARD OF TRUSTEES OF SANTA CLARA COLLEGE

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Dean, College of Law

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Librarian

WILLIAM JOHN LOFTUS
Bursar

EDWARD ALEXANDER AMARAL, M.D.
Director of Student Health

UNIVERSITY CALENDAR*

1950

September

S	M	T	W	Th	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

September 7: Registration, College of Law.
September 8: Instruction begins in College of Law; Registration of Freshmen undergraduates.
September 9: Freshmen Placement Examinations; Condition Examinations.
September 11, 12: General registration for Fall Semester.
September 13: Instruction begins.
September 19: Mass of the Holy Ghost.

October

S	M	T	W	Th	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

October 9, 10, 11: Annual Retreat.
October 12: End of Retreat.
October 16: Tryouts, Dramatic Art Contest.
October 18 - 24: Mid - term examinations. (Mid-term examinations are not given in the College of Law.)

November

S	M	T	W	Th	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

November 1: All Saints Day, a holiday.
November 7: Dramatic Art Contest.
November 16: Annual Memorial Mass.
November 21: Last day for Seniors to file candidacy for graduation in June 1951.
November 23-25: Thanksgiving Recess.

December

S	M	T	W	Th	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

December 4-7: Mid-term Examinations.
December 8: Feast of the Immaculate Conception, a holiday.
December 18 to January 2: Christmas recess.

1951

January

S	M	T	W	Th	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

January 13: Last day to submit Preregistration forms.
January 15: Announcement of prize contests.
January 22-26: Semester Examinations.
January 29 - February 3: Intersemester recess.

*All dates are inclusive dates.

UNIVERSITY CALENDAR *

1951

February

S	M	T	W	Th	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28			

February 5: Registration, College of Law, and Freshmen undergraduates.
February 6: Instruction begins in the College of Law, registration for undergraduates.
February 7: Instruction begins.
February 10: Condition Examinations.
February 22: Washington's Birthday, a holiday.

March

S	M	T	W	Th	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

March 8: Owl Oratorical Contest.
March 14,15,16,20,21: Mid-term examinations.
March 19: Centennial Anniversary.
March 22-27: Easter recess.

April

S	M	T	W	Th	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

April 18: Senior Theses due.

April 23-27: Mid-term examinations.

May

S	M	T	W	Th	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

May 3: Ascension Thursday, a holiday.
May 8: President's Day, a holiday.
May 9: Ryland Debate, Redwood and McCann prize essays due.
May 19: Last day to submit pre-registration forms.
May 30: Decoration Day, a holiday.

June

S	M	T	W	Th	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

June 4-8: Semester Examinations.

June 16: 100th Commencement.

***All dates are inclusive dates.**

OFFICERS OF INSTRUCTION

EDWIN F. ALBERTSWORTH, Professor
Law
A.B., George Washington University, 1915; Ph.D., George Washington University, 1918; S.J.D., Harvard, 1921. Dean of Law, University of Wyoming, 1921-22. Professor of Law, Western Reserve University, 1923. Professor of Law, Northwestern University, 1924-43. Visiting Professor of Law, University of San Francisco, 1938-39; summers of 1940-41-44. Professor of Law, University of California, summer 1943. Visiting Professor of Law, University of Santa Clara, 1938-39; summers of 1940-41. At Santa Clara since 1947.

PHILLIP N. ALLEN, Assistant Professor
Business Administration
A.B., Stanford University, 1931. C.P.A., State of California, 1942. Instructor, Golden Gate College, School of Accountancy, 1946-47. Instructor, University of San Francisco, School of Business, 1947. At Santa Clara since 1947.

O. ROBERT ANDERSON, Professor
Business Administration
A.B., University of Washington, 1934. Instructor in Accounting, University of Oregon, 1937-41. C.P.A., State of Oregon, 1941. At Santa Clara since 1942.

EUGENE MICHAEL BACIGALUPI, S.J., Ph.D.
Physics
Chairman, Department of Science.

JAMES MARIUS BECCHETTI, Lecturer
Business Law
A.B., University of Santa Clara, 1925; LL.B., 1926. At Santa Clara since 1930.

RICHARD E. BECKWITH, Assistant
Physics
B.S., Stanford University 1949. At Santa Clara since 1949.

EDWIN ALANSON BEILHARZ, Associate Professor
History, Political Science
Chairman, Department of History.
Acting Chairman, Department of Political Science.
A.B., Creighton University, 1931; M.A., University of Nebraska, 1934; University Fellowship in History, University of California, 1934-35; Emmanuel S. Heller Memorial Scholar in History, University of California, 1935-36. At Santa Clara since 1936.

LeVERNE E. BLOUNT, Captain, Assistant Professor
Military Science and Tactics
B.S., United States Military Academy. Officer, United States Army, 1943-47. Assistant P.M.S.&T., University of California at Los Angeles, 1947-48. Captain, Field Artillery, United States Army. At Santa Clara since 1948.

LOUIS FRANK BOITANO, Instructor
Business Administration.
B.S., University of Santa Clara, 1947. C.P.A., State of California, 1947. At Santa Clara since 1947.

LLOYD LAWRENCE BOLTON, Professor
Biology
Chairman, Department of Biology.
B.A., University of British Columbia, 1922; M.A., 1924; Ph.D., Cornell University, 1932. Instructor in Biology, University of Saskatchewan, 1928-29. Instructor in Zoology, University of Washington, 1929-31. At Santa Clara since 1932.

JULES ELIE BOURET, Assistant Professor
History
A.B., San Jose State College, 1933; M.A., Stanford University, 1935. Instructor in History, Stanford University, 1944-46. At Santa Clara since 1946.

* JOSEPH S. BRUSHER, S.J., Ph.D.
English, Greek, History

LELAND R. BUNNY, Assistant
Chemistry
B.S., University of San Francisco, 1948. At Santa Clara since 1948.

GEORGE G. BURNHAM, Assistant Professor
Engineering
A.B., Stanford University, 1943; M.S., Stanford University, 1947. Instructor in Mathematics, Menlo Junior College, 1943-44. At Santa Clara since 1949.

ALEXANDER E. BYRNE, S.J.
Philosophy

DONALD ROBERT CAMPBELL, Instructor
Mathematics
A.B., San Jose State College, 1944. General Secondary Credential, San Jose State College, 1947. At Santa Clara since 1948.

WILIAM ARTHUR CARTER, Instructor
Chemistry
B.S., University of San Francisco, 1942. Teaching Assistant Department of Chemistry, Stanford University, 1942-44. At Santa Clara since 1946.

LEONARD JOSEPH CASANOVA
Director of Football
Ph.B., University of Santa Clara, 1927. At Santa Clara since 1936.

ALBERT J. CASTRO, Assistant
Chemistry
A.B., San Jose State College, 1939; M.A., Stanford University, 1942; Ph.D., Stanford University, 1945. Teaching Assistant in Chemistry, Stanford University, 1943. Abbott Laboratories Fellowship in Chemistry, Stanford University, 1942-44. Assistant Professor of Chemistry, University of Arizona, 1947-49. At Santa Clara since 1949.

* Indicates instructing on Los Gatos campus.

EDWARD J. CAVANAUGH, Instructor
Engineering
B.S., Lehigh University, 1943. At Santa Clara since 1948.

JAMES EDMOND COLLINS, Assistant Professor
Business Administration
A.B., Syracuse University, 1940. Instructor in Political Science, Economics and History, Syracuse University, 1941-44. Teaching Assistant in Economics, Stanford University, 1944-46. Instructor in Economics, San Mateo Junior College, 1946-47. At Santa Clara since 1947.

JOHN JOSEPH COTTRELL
Director of Baseball
At Santa Clara since 1946.

WILFRED HENRY CROWLEY, S.J.
Philosophy

C. A. CURREY, M/Sgt.
Military Science and Tactics.

RENE F. DAGENAIS
Band and Choir Director.
At Santa Clara since 1948.

LESTER A. DAUGHERTY, Colonel, Professor
Military Science and Tactics
A.B., University of California, 1916; Graduate, l'Ecole Militaire d'Artillerie; Graduate, United States Army Field Artillery School, National War College. Assistant Professor Military Science and Tactics, University of Illinois, 1929-33. Colonel, Field Artillery, United States Army. At Santa Clara since 1946.

JOSEPH F. DECK, Professor
Chemistry
Chairman, Department of Chemistry
A.B., St. Louis University, 1928; M.S., 1930; Teaching Fellowship, University of Kansas, 1931-32; Ph.D., Universtiy of Kansas, 1932. Graduate work, University of Michigan, 1929. Research Chemist, Stewart Inso Board Corporation, 1932-35. Quality Supervisor, U. S. Gypsum Company, So. St. Joseph, Missouri, 1935-36. Analytical Research, Richmond-Chase Co., San Jose. At Santa Clara since 1936.

**CORNELIUS FRANCIS DEENEY, SJ., Ph.D.
Political Science
Chairman, Department of Political Science

CHARLES JOSEPH DIRKSEN, Professor
Business Administration
Dean of the College of Business Administration
B.S.C., St. Louis University, 1935; M.S.C., 1938. Instructor in Economics, St. Louis University, 1937-38. Graduate work, University of Illinois, 1936. Private Marketing and Advertising Con-

**On Sabbatical Leave.

sultant, 1934-37. Visiting Professor of Marketing at University of Tennessee, 1947. Visiting Professor of Marketing, University of San Francisco, 1948. Dean since 1942. At Santa Clara since 1938.

HUGH COLUMBUS DONAVON, S.J.
Religion

B. STEPHEN EARLEY, S.J.
Religion

AUSTIN JOSEPH FAGOTHEY, S.J.
Philosophy
Chairman, Department of Philosophy

FRANCIS RICHARD FLAIM, Assistant Professor
Biology
A.B., University of Utah, 1936; M.A., 1938. Assistant in Zoology, University of Utah, 1934-35. Teaching Fellowship in Biology, University of Utah, 1935-38. At Santa Clara since 1938.

CARLO MARIA FLUMIANI, Assistant Professor
Political Science
Ph.D., University of Milan, Italy, 1925. Assistant Professor Economics and Statistics, University of Milan, Italy, 1926. At Santa Clara since 1948.

EDMUND CLARENCE FLYNN, Professor
Engineering
B.S. in C.E., Colorado College, 1919; M.S., Iowa State College, 1925. Assistant Professor (Highway Engineering and allied subjects), Iowa State College, 1921-30. At Santa Clara since 1930.

EDWIN GEORGE FORREST
Assistant Football Director
At Santa Clara since 1948.

HENRY GABRIEL, Instructor
Chemistry
B.S., Long Island University, 1934; M.S., George Washington University, 1949. Associate in Chemistry, George Washington University, 1946-49. At Santa Clara since 1949.

PAUL J. GANAHL, Instructor
Engineering
A.B., Stanford University, 1938; M.S., Stanford University, 1948. At Santa Clara since 1949.

GEORGE ALDEN GILBERT, S.J.
Curator of Museums

MARTIN CHRISTOPHER GLAVINA, Assistant Professor
German
A.B., University of California, 1926; A.M., 1928. Teaching Assistant, University of California, 1923-24. At Santa Clara since 1930.

JOHN H. GRAY, S.J.
English

JAMES D. HAND, Lt. Colonel, Assistant Professor
Military Science and Tactics
B.S., Oregon State College, 1937; Graduate, U. S. Army Command and General Staff School. Lieutenant Colonel, Field Artillery, United States Army. At Santa Clara since 1946.

HAROLD PAUL HAYES, Assistant Professor
Engineering
B.M.E., University of Santa Clara, 1941. Registered Engineer, State of California. At Santa Clara since 1946.

RICHARD MANNING HERMES, Professor
Engineering
B.E.E., University of Santa Clara, 1934; M.A., Stanford University, 1938. At Santa Clara since 1935.

DAVIS HUTCHINSON, Assistant Professor
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B.S., Oregon State College, 1940; M.S., 1941. Graduate Assistant, Oregon State College, 1940-41. Instructor, Shrivenham American University (U. S. Army), 1945. Instructor, Oregon State College, 1946. Registered Engineer, State of California. At Santa Clara since 1947.

*CHARLES J. KAVANAGH, S.J.
Latin

JAMES F. KEARNEY, S.J.
Philosophy

JOSEPH P. KELLY, Lecturer
Business Law
Ph.B., Holy Cross College, 1933; J.D., New York University, 1936; LL.M., 1939. At Santa Clara since 1939.

ROLAND W. KING, JR., Assistant
Chemistry
B.S., University of Santa Clara, 1949. At Santa Clara since 1949.

WALTER J. KROPP, S.J.
Greek

WILLIAM FRANCIS LESTER, S.J.
Latin

GERALD EDMUND McDONALD, Instructor
English, Public Speaking
A.B., Boston College, 1947. At Santa Clara since 1947.

ROBERT EMMET McMAHON, S.J.
Business Administration

* Indicates teaching on Los Gatos campus.

JOHN LOUIS MADDUX, S.J.
English

TERRENCE L. MAHAN, S.J.
Philosophy

JAMES JOSEPH MARKEY, S.J.
Religion

JOSEPH LAWRENCE MARTIN ,S.J.
Religion
Chairman, Department of Religion

HERMAN A. MEISTER
Assistant Football Director
A.B., St. Mary's College, 1936. At Santa Clara since 1948.

JOHN HENRY MERRYMAN, Assistant Professor
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B.S., University of Portland, 1943; M.S., University of Notre Dame, 1944; J.D., University of Notre Dame, 1947. At Santa Clara since 1948.

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Greek and Latin

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B.S. in E.E., University of Wisconsin, 1946. At Santa Clara since 1947.

ALBERT JOSEPH NEWLIN
Associate in Meterology and Seismology
B.S., University of Santa Clara, 1913; LL.B., 1914; J.D., 1916; D.Sc., 1934. At Santa Clara since 1918.

EDWARD J. NILAND, JR., Assistant Professor ,
Law
LL.B., Boston College, 1947. At Santa Clara since 1947.

JOHN PATRICK O'CONNELL, S.J.
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UMBERTO OLIVIERI, Assistant Professor
Italian
B.A., Royal Lyceum Ennio Quirino Visconti, Rome, 1903; LL.D., University of Rome, 1910. Professor of English Language and Literature, University of Rome, 1920. At Santa Clara since 1932.

EDWIN J. OWENS, Professor
Law
Dean of the College of Law
A.B., Holy Cross College, 1919; LL.B., Harvard, 1922. Professor

*Indicates teaching on Los Gatos campus.

of Law, Boston College, 1928-33. Dean of the College of Law since 1934. Visiting Professor of Law, Hastings College of Law, summer, 1942. Visiting Professor of Law, Stanford Law School, Fall Quarter, 1945. At Santa Clara since 1934.

ROBERT JOSEPH PERILLAT, Instructor
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B.A., St. Patrick's Seminary, 1943. At Santa Clara since 1948.

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Ph.B., University of Chicago, 1931; M.A., University of Colorado, 1946. Instructor, University of Colorado, 1945-46. Assistant Professor, Colorado College of Agriculture and Mechanical Arts, 1946-47. At Santa Clara since 1947.

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Greek, Latin

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B.S., University of Nevada, 1930; M.S., Columbia University, 1940. Instructor, Rochester Institute of Technology, 1936-42. Assistant Professor, University of Nevada, 1942-43. Registered Engineer, State of California. At Santa Clara since 1948.

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B.C.S., University of Santa Clara, 1943. At Santa Clara since 1949.

DEAN PRITCHETT, M/Sgt.
Military Science and Tactics

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A.B., John Carroll University, 1930; M.A., Loyola University (Chicago), 1934. Instructor, University of Detroit, 1936-39. At Santa Clara since 1946.

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Assistant Football Director
B.S., University of Santa Clara, 1940. At Santa Clara since 1946.

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B.A., University of Santa Clara, 1942. At Santa Clara since 1950.

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A.B., University of Santa Clara, 1935; M.A., University of Washington, 1945. Instructor, University of Santa Clara, 1941-42. At Santa Clara since 1946.

WALTER E. SCHMIDT, S.J.
Religion

HERBERT E. SCHONLAND, Assistant Professor
Mathematics
B.S., United States Naval Academy, 1925. At Santa Clara since 1948.

* FRANCIS J. SEELIGER, S.J.
Ascetical Theology

EDWARD SHIPSEY, S.J.
English
Chairman, Department of English

* FRANCIS J. SILVA, S.J.
English, Public Speaking

HARRY F. SHIRES, JR., SFC
Military Science and Tactics

FERDINAND J. SPIELER, S.J.
Physics

* DONALD FRANCIS ST. SURE, S.J.
Greek, Latin

GEORGE J. STEPOVICH, Lecturer
Law
Ph.B., University of Santa Clara, 1933; LL.B., 1935. At Santa Clara since 1937.

GEORGE LEONARD SULLIVAN, Professor
Engineering
Dean of the College of Engineering
B.S. in M.E., University of Nebraska, 1908; M.E., University of Colorado, 1910; Ph.D., University of Santa Clara, 1914. Instructor in Mechanical Engineering, University of Colorado, 1908-11. Assistant Professor of Mechanical Engineering, Montana State College, 1911-12. Phelps-Dodge Corporation, 1918 (on leave from Santa Clara). Dean since 1918. At Santa Clara since 1912.

* Indicates teaching on Los Gatos campus.

FLOYD O. TACKLIND, Major, Assistant Professor
Military Science and Tactics
B.A., Eastern Washington College of Education, 1938. Major, Field Artillery, United States Army. At Santa Clara since 1948.

WILLIAM J. TOBIN, S.J.
Religion

ROBERT D. TOMASHEK, Instructor
Education
B.S., Eau Claire State Teachers College, 1938; M.A., Columbia University, 1941. At Santa Clara since 1948.

CLEMENS VAN PERRE, Assistant Professor
French
B.A., Royal Lyceum, Antwerp, 1908; Graduate, Athenaeum of Antwerp (Belgium) 1911; Graduate, Royal Conservatory, Antwerp, 1913; Graduate, University of Louvain, 1913-14. Director of Music, Mt. Angel College, 1920-25; Columbia University (Portland), 1925-32. At Santa Clara since 1932.

VICTOR BENJAMIN VARI, Assistant Professor
Spanish
A.B., San Francisco State College, 1942. University of Sorbonne, (France) 1945. University of Lausanne, (Switzerland) 1945-46. Stanford University, 1946-49. At Santa Clara since 1946.

KARL EDWIN VON DER AHE, S.J.
Religion

JAMES EDGAR WADE, Associate Professor
English
A.B., University of Notre Dame, 1933; M.A., 1935. Ph.D., St. Louis University, 1942. Instructor, St. John's University, 1939-40. Associate Professor, University of San Francisco, 1940-48. At Santa Clara since 1948.

HENRY LOUIS WALSH, S.J.
Religion

STUART PARRY WALSH
Director, Bureau of Research
Ph.A., University of Chicago, 1915. Graduate work, University of California at Los Angeles. Economic Counsel, State of California Department of Justice, Reconstruction and Re-employment Commission, 1942-46. Instructor, Stanford University, E.S.M.W.T. Program, 1943-44. At Santa Clara since 1949.

AUSTEN DEN WARBURTON, Lecturer
Law
A.B., San Jose State College, 1938; LL.B., University of Santa Clara, 1941. At Santa Clara since 1946.

WILLIAM JOSEPH WARREN, Professor
Engineering
Chairman, Department of Electrical Engineering
B.S. (E.E.), University of Santa Clara, 1931; M.S., University of Illinois, 1933; Ph.D., (Engrg.), University of Illinois, 1936. Assistant in E.E., University of Illinois, 1934-35. Instructor in E.E., University of Illinois, 1935-37. General Electric Company, 1937-38. Associate in E.E., University of Illinois, 1938-41. At Santa Clara since 1941.

ALBERT D. WASEL, Assistant Professor
Mathematics
A.B., University of Pittsburgh, 1934; M.Ed., 1939. Instructor of Mathematics, University of California, 1946-47. At Santa Clara since 1947.

JOHN ANTHONY WEBER, S.J.
Director of the Ricard Memorial Observatory

JOHN E. WEIDLICH, JR., Instructor
Mathematics
B.S., Stanford University, 1948. Instructor, Waynesbury College, Pennsylvania, 1941-42. Instructor in R.O.T.C. and A.S.T.P., University of Michigan, 1943. At Santa Clara since 1949.

MAURICE WILSON WELDS, Instructor
B.A., University of Washington, 1938; M.A., Columbia University, 1940. At Santa Clara since 1947.

RUSSELL WILSON, S.J., Ph.D.
Philosophy

CHESTER G. YOUNG, Assistant Professor
Acting Chairman, Department of Mathematics
A.B., San Diego State College, 1936. At Santa Clara since 1946.

JESSE M. ZIMMERMAN, Lecturer
Engineering
B.S., University of Nebraska, 1922; J.D., Loyola University at Chicago, 1942. Associate Professor in Engineering, San Jose State College, 1949-50. Professor, Golden Gate College, 1948. At Santa Clara since 1949.

VICTOR F. STEFAN
Alumni Secretary
B.S., University of Santa Clara, 1946.

DENNIS ALOYSIUS HEENAN
General Manager of Athletics
B.A., University of Notre Dame, 1930.

MAURICE WILSON WELDS
Director of Public Relations
B.A., University of Washington, 1938; M.A., Columbia University, 1940.

LIBRARY

Edward Richard A. Boland, S.J. ..... Librarian of the University

Bernice E. Weatherholt, A.B., J.D. ..... Law Librarian

Beryl M. Hoskin, A.B. ..... Reference Librarian

Betty L. Hammargren, B.S. ..... Cataloguer

Gordon Curtis ..... Periodical Librarian

Phyllis V. Dougherty ..... Assistant, Catalogue Department

Betty F. Jones, A.B. ..... Assistant, Reference Department

DONOHOE INFIRMARY

Edward A. Amaral, M.D. ..... Director of Student Health

Gertrude O. Larson, R.N. ..... Chief Nurse

Dorothy I. Crane ..... Nursing Assistant

Mary Ritchie ..... Nursing Assistant

TECHNICAL AND CLERICAL ASSISTANTS

Jean M. Bernal ..... Telephone Operator

Clark L. Campbell, M/Sgt. ..... Office of Military Science and Tactics

Ellen M. Chrisman ..... Bursar's Office

E. Lois Cozad ..... Alumni Office

Mary P. Domenichini, B.S. ..... Admissions Office

Thomas E. Eazarsky, S F C ..... Office of Military Science and Tactics

Fred P. Faltersack ..... Engineering Technician

Helen E. Ferris ..... College of Business Administration Office

M. Claire Haley, B.A. ..... Registrar's Office

Mabel M. Hashimoto ..... Admissions Office

John P. Kropp ..... Engineering Technician

Marie F. Lima ..... College of Arts and Sciences Office

Christine E. Maciel ..... Law School

Eunice L. Maino ..... Athletic Office

Elizabeth A. Marsh ..... College of Engineering Office

George A. Olcese ..... Vice President's Office

Frances A. O'Neill ..... Bursar's Office

Elizabeth V. Palmer ..... Telephone Operator

Harmon J. Parker ..... Mimeograph and Mail Room

Nadyne R. Petri ..... Registrar's Office

Richard F. Rebello ..... Bookstore

Helen K. Reedy ..... College of Business Administration Office

Woodrow W. Reedy, M/Sgt. ..... Military Science and Tactics

Brother George A. Rice, S.J. ..... Bookstore

Henry F. Schmidt, B.S. ..... Athletic Office

Frank A. Schneider, B.S.C. ..... President's Office

William A. Schwartz, 1st Sgt..... Office of Military Science and Tactics

George J. Seigel, M/Sgt. ..... Office of Military Science and Tactics

Jeanne D. Weltz ..... Bursar's Office

Donald R. Zuckswert ..... Biology Laboratory Assistant

FACULTY COMMITTEES

ADMISSIONS

The Director of Admissions and two members of the Faculty appointed by the President.

ATTENDANCE AND DISCIPLINE

The Director of Discipline and the Dean of the appropriate College.

DEGREES

The Dean of the appropriate College, Head of the Department and the Registrar.

DRAMATICS AND PUBLIC EXERCISES

The Dean of the College of Arts and Sciences, Director of Discipline, and the Director of Dramatics.

SCHOLASTIC STANDING

The Deans of the various Colleges, and the Registrar.

STUDENT ORGANIZATIONS

The Director of Discipline and the Director of each organization.

STUDENT PUBLICATIONS

The Director of Discipline and the Faculty Moderators.

THESES

The Dean of the appropriate Colleges and the Head of the Department.

ATHLETICS

Two members of the Faculty and five members of the Alumni Association appointed by the President.

GENERAL INFORMATION

LOCATION

The University of Santa Clara, conducted by the Jesuit Fathers, is situated at Santa Clara on the site of the old Mission, in the southern part of the San Francisco metropolitan district and immediately adjacent to San Jose. Frequent railroad and bus service provides easy access to the various Bay cities, and direct connections to all parts of California and the West.

The valley of Santa Clara is famous throughout the world for the beauty of its scenery, the salubrity of its climate, and the excellence of its fruits. The climate is mild and equable both in summer and winter, and on that account singularly favorable for persistent study and research as well as for the maximum of agreeable out-of-doors recreation which such work makes necessary.

HISTORY

Mission Santa Clara. On January 12, 1777, two Franciscan Padres, de la Pena and Murguia, planted the Mission Cross and laid the foundations of Mission Santa Clara on the banks of the Guadalupe, about a mile and a half from the University grounds. Two years later a flood destroyed both church and monastery, and the Padres in consequence removed the Mission to the second site, two blocks from the present church. There, on November 9, 1781, they laid the foundation of a large adobe church and mission buildings. Three years later, on May 15, 1784, the new church was dedicated by the Venerable Padre Serra, then Padre Presidente of the Missions of California.

Owing to damage by earthquakes in 1812 and 1818 the Padres were forced to build anew and this time selected the site of the present Mission. There, on August 11, 1822, a still larger church was dedicated. With the passing of time the original church was largely rebuilt, though the chancel and the interior arrangements remained substantially as originally constructed. In October, 1926, the Mission was destroyed by fire and rebuilt in 1927, along the lines of the original structure. This new Mission was dedicated in 1928. The restoration of the Mission was made possible by the generosity of friends in the Santa Clara Valley as well as friends and Alumni of the University throughout the State of California.

In 1836 Mission Santa Clara was secularized and passed from the hands of the devoted Padres into those of politicians, who robbed the Mission of her lands and oppressed or drove away her children. When Rt. Rev. Joseph Sadoc Alemany, O.P., arrived as Bishop of the Diocese of San Francisco in 1850, he found only one Franciscan in charge of the Mission, which had been restored by the American government, though in a sadly reduced form.

Santa Clara College. Desiring to save the remnants of the Mission, and also to start a college to meet the growing need of the times, the Bishop invited the Society of Jesus to Santa Clara. The invitation was accepted, and accordingly on March 19, 1851, Father John Nobili laid the foundation of Santa Clara College.

He adapted the old adobe buildings to the requirements of a college. On April 28, 1855, the institution was chartered a University and continued to be known as Santa Clara College until 1912. It is the oldest institution of higher learning in the west. In 1857 the degree of A.B. was conferred on Thomas I. Bergin, the first to receive that degree from any California college.

During the subsequent years the College grew in influence and attendance. Several large new buildings were added, and for many years Santa Clara College, in both equipment and scholastic standing, ranked as the leading educational institution in the west. In its sixty years of existence as a college over seven thousand students were matriculated.

THE UNIVERSITY. In 1907 lectures were commenced with a view of preparing students to enter upon the professional courses in law, medicine and engineering. In 1911 the pre-medical course was established and the law school begun. Realizing, therefore, that the College was doing the work of a university, the President, Father James P. Morrissey, S.J., and the Board of Trustees adopted officially the name of "The University of Santa Clara," this decision going into effect on April 29, 1912.

In the summer of 1912, engineers of high standing were engaged to carry on the courses in engineering, and in the next summer a thoroughly equipped laboratory for engineering was prepared. In the same year the amount of work required by law students was increased and the classes in Law were held at night.

The outbreak of the War suspended the plans for expansion and it was not until after its close that they were resumed. In 1923 an extensive building program was commenced, with a view to provide an adequate material basis for the University, and during the following years there has been added a group of new buildings, including Alumni Science Hall, 1923; Montgomery Laboratories, Seifert Gymnasium, Kenna Hall and the Service Building, 1924; Donohoe Infirmary, 1925; the remodeling of the Auditorium in 1926; the Ricard Memorial Observatory, the Seismological and Meteorological Stations, the New Mission Church in 1928, Nobili Hall in 1930, the Varsi Library in 1931, Bergin Hall in 1938, the Delia L. Walsh Hall (Administration Building) in 1950, and the James E. Walsh Hall (Dormitory) in 1950.

Accompanying the Building Program there has come a corresponding growth in attendance and scholastic work. In 1923 the Pre-Medical course was restored, and a four year College of Business Administration added. In 1925 the College of Law was increased to four years; and the Preparatory Department transferred to a separate campus on the former property of the College of the Pacific at College Park, San Jose. In 1926 the University celebrated its Diamond Jubilee and with enlarged facilities and equipment entered upon a program of greater service to the Church and state. In August, 1929, plans were formulated whereby the standing of the College of Law would be greatly increased. Since August, 1930, all classes in the College of Law previously held at night have been taught under the new plan as morning classes. This plan put the College of Law on a basis more in accordance with the standards of the American Bar Association. In 1949 the Research Institute was established.

SYSTEM OF EDUCATION

The Jesuit system of education aims at developing side by side the moral and intellectual faculties of the student, at sending forth to the world men of sound judgment, of acute and rounded intellect, of upright

and manly conscience. And since men are not made better citizens by the mere acquisition of knowledge, without a guiding and controlling force, the principal faculties to be developed are the moral faculties. Moreover, morality is to be taught continuously. It must be the underlying base, the vital force supporting and animating the whole organic structure of education. It must be the atmosphere the student breathes. It must suffuse with its light all that he reads, illuminating what is noble and exposing what is base, giving to the true and false their relative light and shade.

Because of its conservative system of education, its solid philosophical system and the highly specialized training required of those who qualify as professors, the University of Santa Clara is particularly prepared to train leaders of men.

Though the Catholic Religion is the religion professed by the Faculty and by the larger number of the students, members of all religions are admitted provided they are willing, for the sake of order and uniformity, to conform respectfully to the religious observances of the University.

GROUNDS AND BUILDINGS

Location. The University has two campuses. One, of approximately forty acres, is situated on the El Camino Real in the City of Santa Clara on the site of the third Mission Santa Clara. On one half of this campus the University buildings, grouped in series of quadrangles around the Mission Church, provide a continuation of the original Mission. On the other half of this campus are located the Athletic and R.O.T.C. fields. The second campus of the University, where special studies are pursued, comprising five acres is located just outside the Town of Los Gatos.

Mission Santa Clara, built in 1822, and the Students' Chapel, built in 1887, were destroyed by fire on October 25, 1926. Through the generosity of Alumni and friends of the University, a new Mission Church, a replica of the original church, stands on the former site, the heart and center of University activities. It serves as the Students' Chapel and enshrines the priceless relics of the old Mission rescued from the fire by the heroic efforts of the Faculty and students.

The Faculty Residence, built in 1911 to replace the old Fathers building destroyed by fire in 1909. It contains reception rooms, residences of the Fathers and Scholastics, and private chapel.

O'Connor Hall, built in 1912, is the gift of Mr. and Mrs. Myles P. O'Connor. On the first floor are the class-rooms of the College of Arts and Sciences. The second and third floors contain private rooms for the upper class-men. In the basement are the cooperative bookstore and the Paleontological and Geological Museums.

The Theatre, originally built in 1870 and completely reconstructed in 1926, is one of the largest theatres for amateur productions in the West, and has been the scene of such notable dramatic productions as the Passion Play and the Mission Play of Santa Clara.

Alumni Science Hall, built in 1924, is the gift of the Alumni of Santa Clara and contains offices, lecture rooms and laboratories of the Departments of Biology, Chemistry and Physics; and the electrical equipment service rooms.

Robert E. Kenna Hall, erected in 1924, is dedicated to Rev. Robert Emmet Kenna, S.J., student, professor and twice president of Santa Clara College. On the first floor are the offices, class rooms, laboratories and library of the College of Business Administration, headquarters of the Reserve Officers Training Corp, the general offices of the coaches and the

general manager of athletics, and classrooms. The two upper floors contain private rooms for the lower division students.

Montgomery Laboratories, erected in 1924, are dedicated to John J. Montgomery, "Father of Aviation," one time Professor of Physics in the University. On the first floor are the materials testing, mechanical, and electrical laboratories of the College of Engineering. In 1930 a second story was added, which houses offices, drawing and lecture rooms and library.

Seifert Gymnasium, erected in 1924, is a bequest of the late Dr. George W. Seifert, B.S. '79. It houses the plunge (40x100x10), the basketball court (65x100), locker rooms for Varsity and class teams, music rooms and students' lounging room, and is the center of social life at the University.

The Service Building, erected in 1924, houses the laundry, power and heating plant and service rooms. The second floor provides a dormitory for employees.

Donohoe Infirmary, erected in 1925, is the gift of Miss Katharine Donohoe in memory of her father and mother, James and Rose Donohoe. It is a complete small hospital, with private rooms and ward, diet kitchen, dispensary, operating room, chapel, and offices for the infirmarian and visiting physician.

The Ricard Memorial Observatory is the gift of the Knights of Columbus of California to the "Padre of the Rains." This building, with its three domes, houses the telescopes, the spectroheliograph and other instruments. An underground passageway connects the vault of the Seismic Station to the Observatory. The new Seismic Station contains the 80Kg Wiechert Horizontal and Vertical Seismographs, three new Galitzin Seismographs of the long range type and the two new Wood-Anderson Seismographs, especially designed for local earthquakes. A specially constructed clock niche in the vault will contain a "Shortt Synchronome Clock" and will be kept at a constant temperature by means of a highly sensitive thermostatic control. The Observatory likewise houses the other necessities of a station of this type, such as battery rooms, photographic dark rooms and offices where the records are kept for study and reference.

Nobili Hall, erected in 1930, is dedicated to the Rev. John Nobili, S.J., the first president of the University. On the first floor are the refectories for the Fathers, lay faculty, students, guests and employees; kitchens and service rooms. The second floor contains rooms for the lay professors as well as for the students. The third and fourth floors have rooms reserved entirely for students.

The Library. Construction of Varsi Library commenced on March 12, 1931, and the building was dedicated on October 10, 1931. The first floor has private study rooms for the Faculty, departmental reading rooms, offices of the librarians, students' reading room and stack room. In the stack room provision is made for 120,000 volumes, allowing for expansion. The main reading room affords simultaneous accommodations for one hundred and seventy-five readers. The Library was made possible through the generosity of a distinguished alumnus of Santa Clara. It was named the Varsi Library in honor of the sixth President of Santa Clara, a lifelong friend of the donor.

Bergin Hall is the gift to Alma Mater of her first graduate, Hon. Thomas I. Bergin, A.B. '57. This building is used exclusively for the College of Law and contains the library, moot court, conference rooms for students and faculty, classrooms and offices of the Law Faculty.

Delia L. Walsh Hall, completed in the early months of 1950, contains the administrative offices of the University. Its construction was made possible by a substantial gift to the University by Delia L. and James E. Walsh.

James E. Walsh Hall, to be ready for Fall occupancy in 1950, is being constructed to honor the memory of an alumnus of the University who provided most generously for the University in his will. The building contains a recreational center and living quarters for students.

SUBSIDIARY BUILDINGS

After the war, with financial aid from the Federal and State government, additional laboratories for the science departments and for the College of Engineering, space for additional recreational facilities for students, storage buildings, apartments for 114 married veterans, were constructed. These buildings, temporary in nature, are still in use.

LABORATORIES

The laboratories of the departments of Biology, Chemistry and Physics are located on the three floors of the Alumni Science Hall.

The laboratories of the College of Engineering are located in the Montgomery Laboratories and provide complete laboratory facilities for engineering courses.

The Astronomical, Seismological and Meteorological laboratories are located in the Observatory group.

ENDOWMENT AND NEW BUILDINGS

The growth in the number of students and the work of the University has made it imperative that adequate buildings and endowment be provided. For this, and in order that Santa Clara may widen its scope as an educational institution of recognized standing, funds are necessary. Santa Clara stands in imperative need of an endowment. The work the University has accomplished in the past is an earnest of what she will do when increased facilities are afforded her. The University of Santa Clara Alumni Association is currently conducting an appeal to establish a substantial endowment on the occasion of the University's Centennial celebration in 1951.

An endowment implies a founder or founders and benefactors. During the past few years, many have helped the University and generous donations have been made. The new Mission Church, Faculty Residence, Donohoe Infirmary, Bergin, O'Connor, and Alumni Science Halls, Seifert Gymnasium, Ricard Memorial Observatory, Nobili Hall, Varsi Library, and the new Delia L. Walsh and James E. Walsh Halls are inspiring examples of such support.

But before other buildings, for which the plans of the University provide, may be added, further benefactions will be needed. Other institutions, even those state-aided and richly endowed, receive generous assistance in their work and hesitate not to ask for it. Santa Clara feels that generous friends are not lacking, though for the want of deeper thought on the matter, few realize the importance of Christian educational work, the immense sacrifice it entails, and the merit there is in cooperating and sharing with Christian educators in their work for God and country and the welfare of the young men of our generation.

The Jesuit faculty of the University has given its life services freely and gladly to the work. It enjoys the wholehearted co-operation of a large group of highly trained and competent lay associates. Those who would

share in this great enterprise can do so most effectively by rendering material aid and contributing funds for the continuance and development of the work.

FORM OF BEQUEST

I give and bequeath unto the President and the Board of Trustees of Santa Clara College, a corporation duly incorporated under the laws of the State of California, a sum of ..... dollars.

NEED OF ADDITIONAL SCHOLARSHIPS

Every year deserving young men of high character and aspirations, whose means do not permit their attending the University, appeal to the Faculty for assistance to obtain the education for which their talents and vocations fit them. There is scarcely a university in the United States which is not provided with a fund for this purpose, and a relatively large per cent of successful college men spring from the class of assisted students. To contribute to such a purpose is clearly a noble benefaction. But this is especially so with regard to those who apply for help to the University of Santa Clara. They are as a rule young men of high standing, who understand the paramount value of an education in a university which aims at the highest intellectual development of the student, while devoting no less attention to the perfect development of his moral character. As a consequence, to assist them in attaining their desire is to aid picked young men whose future is more than ordinarily full of promise, and who are destined to exert a most powerful influence on those among whom their lives will be spent.

Through the generosity of friends of the University a few such scholarships have been established, but there is need for many additional scholarships, either through permanent endowment or by annual gifts.

SCHOLARSHIP QUALIFICATIONS

Besides the conditions laid down by the donors, all scholarships administered by the University are subject to the following conditions:

First: Recipients of scolarships will be chosen from among those students who have been registered at the University for at least one year.

Second: In choosing students who are to benefit by the various scholarships preference will be given to needy and deserving students.

Third: Students who are recipients of scholarships must maintain at least a C average.

Fourth: In selecting students for scholarships participation in extra-curricular activities will be taken into account in all cases. Such activities will be debating, dramatics, athletics, music and contributions to the University Weekly and Annual. Continuance in extra-curricular activities will be required of all holders of scholarships.

Fifth: Any student benefitting by a scholarship who has a semester average below passing in any subject will automatically forfeit said scholarship.

Sixth: Once a scholarship has been awarded, the student continues to benefit by it as long as he satisfies the prescribed conditions.

Seventh: Scholarships may be cancelled at any time by the Administration for any infraction of the rules and regulations of the University.

ESTABLISHED SCHOLARSHIPS

The Alice Phelan Sullivan Memorial Scholarship

This perpetual scholarship for a resident student was founded in 1912 by the gift of $12,500 from "A Friend" in memory of Mrs. Alice Phelan Sullivan of San Francisco.

The Jesse W. Bryan Memorial Scholarship

This perpetual scholarship for a resident student was founded in 1913 by the gift of $12,500 by Mrs. Sarah A. Bryan in memory of her son, Mr. Jesse W. Bryan, a former student of Santa Clara.

The James Dunne Scholarships

These perpetual scholarships were founded in 1931 by the gift of $200,000 from Mrs. Viola K. Dunne in memory of her husband James Dunne, '74. They are fifteen in number and are to be applied to resident students from the State of California.

The James D. Phelan Scholarships

These perpetual scholarships were founded in 1931 by the gift of $50,000 from the Hon. James D. Phelan, Ph. D. 1903. They are twenty in number.

The Mamie H. Evans Scholarships

The fund for these perpetual scholarships was established by Mrs. Mamie H. Evans with a bequest of $9,275 in 1940. The fund to be known as the Mamie H. Evans Memorial Scholarship Fund.

The Katherine Connor Scholarships

These perpetual scholarships were founded in 1942 by the gift of $4,500 bequeathed by Katherine Connor. The fund to be known as the Katherine Connor Scholarship Fund.

The de Saisset-Filipello Scholarship

A perpetual scholarship founded by Miss Isabel de Saisset anl Mrs. E. A. Filipello to be given to a student of the University designated by the President.

The Alumni Scholarship

A perpetual scholarship founded by the Alumni Association of the University to be given to a deserving student.

The John Paul Paganini Scholarship

A perpetual scholarship founded by the Charles M. Paganini family by a gift of $10,000 in memory of their son of the class of 1938 who lost his life in World War II.

The Robert L. Jacobs Scholarship

A perpetual scholarship founded by friends of Robert L. Jacobs of the Class of 1945 who lost his life in World War II. This scholarship to be given to a student designated by the President of the University.

The Sexton Scholarships

These perpetual scholarships were founded in 1946 by the gift of $54,000 bequeathed by Mr. John E. Sexton. The fund to be distributed equally as follows:

The John Sexton Scholarship, in memory of the father of the donor, to be given to a resident student from El Dorado County, California.

The Catherine Sexton Scholarship, in memory of the mother of the donor, to be given to a resident student from El Dorado County, California.

The J. E. Sexton Scholarship, in memory of the donor, to be given to a resident student from Eureka County, Nevada.

The Benjamin Patocchi Scholarship

A perpetual scholarship founded in 1949 by the gift of $8,000.00 bequeathed by Mr. Benjamin Patocchi. This scholarship is to be given to a student designated by the President of the University.

The Frank and Alice Walterstein Scholarships

Two perpetual scholarships founded in 1949 by the gift of $35,916.00 bequeathed by Mrs. Alice Walterstein. They are to be known as the Frank Walterstein, Sr. and Alice Walterstein scholarships and are to be given to deserving students of the University designated by the President.

THE PRESIDENT'S SCHOLARSHIPS

The following scholarships, established in 1935 by the President of the University, to be awarded to needy and deserving students:

The Edward J. Hanna Scholarship. A four-year scholarship valued at $300 annually, founded in honor of His Excellency the Most Reverend Edward J. Hanna, D.D., Archbishop of San Francisco, on the occasion of his Golden Sacerdotal Jubilee.

This scholarship is at the disposal of the Archbishop of San Francisco to be given to a graduate of the Catholic High Schools of the Archdiocese.

The St. Robert Bellarmine Scholarships. Two four-year scholarships, one for a resident student, valued at $300 annually and for a non-resident student, valued at $200 annually, to be given to graduates of Bellarmine College Preparatory School who shall be deemed most deserving by the Faculty of that school.

The St. Ignatius of Loyola Scholarships. Two four-year scholarships in the College of Engineering for resident students, valued at $300 annually, one to be given to a graduate of St. Ignatius High School, San Francisco, and one to a graduate of Loyola High School, Los Angeles. The recipient in each case to be chosen at the discretion of the Faculties of the respective institutions.

The St. Joseph Scholarship. A four-year scholarship for a resident student valued at $200 annually, to be given to a graduate of St. Joseph's High School, Alameda, who shall be deemed most deserving by the Faculty of that institution.

THE ROBERT L. COWARD MEMORIAL SCHOLARSHIP FUND

This fund is to maintain scholarship resources to be used for encouraging and stimulating the participation of young men of the University of Santa Clara in inter-collegiate athletics.

Applicants for these scholarships must meet the standards of the University academic requirements, possess sound moral character, ability to perform satisfactory academic work at the college level, qualities of leadership, and vocational promise.

The scholarships from this fund will be administered by the Administrative Officers of the University of Santa Clara.

The amounts granted will be $450 for one academic year. Additional amounts may be granted on the basis of need.

STUDENT LOAN FUND

The following loan fund is open to students of the University under such conditions as may be provided by the President:

Catala Club Loan Fund. This fund established and administered by the Catala Club is available, upon application, to the students of the University. The Catala Club is an association of the mothers of present and past University students and of other women interested in the work of the University. Its officers may be contacted by addressing the University.

STUDENT EMPLOYMENT

Employment is available at the University for a small number of students who need to earn the means to defray part of their school expenses. Positions range from that of assistant in the dining hall to that of secretary to a teacher. The compensation is according to the number of hours given to the work, and the amount earned is applied on the student's account with the University. Preference for employment is given to worthy students of high scholastic standing. All students so employed must carry their regular schedule with an overall semester average of "C".

EXPENSES

Resident Students

Tuition, per semester	$175.00
Board and Lodging, per semester	275.00
Deposit for Laundry, per semester	20.00
Room Deposit	10.00
Professional Medical Fee, per semester	10.00
Deposit for Books, per semester:	
Law Students	35.00
Engineering Students	30.00
Other Students	20.00

Non-Resident Students

Tuition, per semester	$175.00

For All Students

Matriculation Fee, paid at first entrance only	10.00
Student Activity Fee, per semester	10.00
Library Fee, per semester	10.00
Law Library Fee, per semester	10.00

Military Science Fees and Deposits

First year basic course	10.00
Second year basic course	10.00

Special Charges

For registration on the first day after the opening of semester	2.50
For each day thereafter	1.00
For each examination taken out of time or to remove a condition	2.00
For course in Subject "A," each time	5.00
For each syllabus (synopsis of semester's work in any subject furnished by professor)	2.00
For each copy of the student's record other than the first	1.00
For failure to submit required administrative forms on time, e.g., pre-registration forms, application for degree, etc.	1.00
Laboratory Fees, per semester:	
Physics, each course	12.50

Engineering, Freshman and Sophomore	10.00
Engineering, Junior and Senior	25.00
Engineering, Jun., Sub-Sen., Sen., (five year plan)	17.00
Biology 21, 22, 101, 102, each	15.00
Biology 23, 24, each	12.50
Biology 103, 107, each	7.50
Biology 105, 106, 109, each	5.00
Biology 108, per unit	2.50
Chemistry 2A, 2B, 34A, 34B, each	10.00
Chemistry, 1A, 1B, 3A, 3B, 10A, 10B, 14, each	15.00
Chemistry 30A, 30B, 115, 133, 150C, each	18.00
Chemistry 180, per unit	10.00
Deposit in all laboratories to cover breakage, etc.	5.00
Graduation Diplomas and Certificates	15.00
Engineering, Summer Surveying (Tuition)	25.00
Law, Special Study (tuition)	85.00
Law Library Fee	5.00
Professional Medical Fee	5.00

RESIDENT STUDENTS

The rental for private rooms covers charges for light, heat and care. No additional electrical appliances may be installed by students without permission of the Vice-President and the payment of extra charges.

An extra charge of $25 for Board and Lodging will be made for each student living at the University during the Christmas Recess.

Pocket Money and Incidentals. The amount of pocket money and money for incidentals is left entirely to parents and guardians. The University prefers that parents deal directly with the students. Should, however, parents or guardians wish the Treasurer of the University to look after these matters, they must deposit a sufficient amount with him and instruct him how the money is to be used. The University does not advance money for these purposes.

Infirmary Charges. Charges for the ordinary attendance of the University Physician, Nurse and attendants are provided for by the Professional Medical Fee. Medicines are charged at cost prices. For a room in the Infirmary, a dollar a day is charged.

Articles to Be Brought. Students who come to reside at the University should bring their own blankets and bed covers. Sheets and pillow cases are furnished by the University. The student wardrobe is regulated only by the request that levis be not worn on the campus. Clothing to be sent to the University laundry should be marked distinctly with the student's name.

Payments

All charges must be paid half-yearly in advance. Remittances should be made in the name of the University of Santa Clara, and sent to the Treasurer of the University. Deferred payments of bills or reductions can be sanctioned only by the President. For such a concession a fee of $1.00 per month will be charged for each $200.00 or fraction thereof remaining unpaid. If payment is deferred without a satisfactory understanding with the President, the latter is directed by the Trustees to remove the student in question from the institution. Semester bills and unpaid balances are subject to sight draft ten days after the bill is rendered.

Payment for veteran students is based on the Schedule of Maximum Charges, according to Veterans Administration Circular 268.

It is distinctly understood that no student is entitled to take any semester examination or receive any diploma or degree or be furnished with a record of his credits while any bills due the University remain unpaid.

Refunds

There will be no refund made on Fees or Special Charges.

Refund on Tuition will be prorated quarterly according to the following plan: Any student withdrawing prior to November 15th or April 15th will have refunds made for the second half of the semester. No refund will be made for students withdrawing after the above dates.

Refund on Board and Lodging will be prorated weekly from the beginning of the week following the date of withdrawal. No refund will be made for withdrawal after the first day of the last month of each semester. No refund will be made until the month following withdrawal.

STUDENT ORGANIZATIONS

College life must include the development of the social side of every student's character. Marked initiative and leadership in organized religious and social movements for the common welfare of his fellows, are qualities expected of college men generally. For this purpose the University student organizations and activities furnish splendid opportunity.

RELIGIOUS ACTIVITIES

As the first thought of the Universtiy is the encouragement of a sound religious life on the part of the student body, special attention is given to those sodalities and religious organizations sponsored by the Church, some of which have existed at Santa Clara for approximately a century.

Sodality of the Immaculate Conception. Its object is to promote in its members a special and filial devotion to the Immaculate Mother of God, to imitate her virtues, to encourage, both by word and example, an eminent purity of morals and a manly fidelity to the practice of religion.

The League of the Sacred Heart. The object of this Association is to foster in the students an earnest religious spirit, particularly a deep and tender love towards our Lord in the Sacrament of His Love, and a consequent reparation for the offenses committed against Him. To this end the First Friday Communion is zealously encouraged.

The Saint John Berchmans' Sanctuary Society. This society has as members those students who as a reward for good conduct and exact application to their studies have been allowed to serve at Mass and assist at the other services in the College chapel.

Holy Name Society. The purpose of this society is the public manifestation of belief in the Divinity of our Lord Jesus Christ.

STUDENT CONGRESS OF THE UNIVERSITY

The Student Congress of the University is the student body organized for the encouragement of student activities, and such other work as may be recommended by the Faculty.

NATIONAL HONOR SOCIETIES

Alpha Sigma Nu. Alpha Sigma Nu is a National Honor Society with chapters in various Jesuit Colleges and Universities throughout the United

States. It is a society organized of honor students who have distinguished themselves in Scholarship, Service and Loyalty to their College or University.

Alpha Phi Omega. The Eta Alpha Chapter at the University of Santa Clara is a chapter of the Alpha Phi Omega national service fraternity. This is an honor fraternity composed of students who are above average academically and who are outstanding in campus activities and in their loyalty to the University and student-body. It is neither secret nor a social fraternity, and its members are selected on the basis of "Leadership, Friendship and Service."

DEPARTMENTAL ORGANIZATIONS

Each department of the University has its own organization for the study of technical problems and for the encouragement of social life among the students of the department.

The Engineering Society. This is an organization made up of students in the College of Engineering with the object of familiarizing them with the conduct of meetings of public bodies and the acquisition of ease in public speaking. Lectures to the engineering students are given before this body.

The Business Administration Association. This is an organization of students in the College of Business Administration for the study of business problems and for the encouragement of social activities among the students of the College. Frequent lectures are given before the Association by business men of prominence.

Mendel Club. This is an association of students preparing for the study of medicine, organized for the study of scientific subjects and the encouragement of such activities as are of particular interest to the students of this department.

The Student Bar Association. This organization exists to encourage fellowship, to foster individual initiative, to provide an organ for the expression and execution of constructive ideas and to provide a liaison body between students and faculty. It sponsors student activities and develops a sense of professional responsibility in its members. Its organization is patterned after that of the State Bar of California. Its membership is open to all students in the College of Law and all students are urged to become members of the Association in order that they may share in the benefits of such membership.

The Arts Society. This organization is made up of students of the College of Arts and Sciences whose object is to create and foster literary talent among the students and to preserve the classical traditions for which the University has been noted for more than seventy-five years.

The International Relations Club. This is an association of the students interested chiefly in Political Science. The purpose of this organization is the study of international problems of both the past and the future. It is affiliated to the Carnegie International Clubs.

The Galtes Chemistry Society. This organization is made up of students in the Department of Chemistry whose object is to encourage the students in the study of Chemistry and to further such activities as are of interest to students of Chemistry.

The Nobili Club. Named to honor the memory of the first president of Santa Clara, Rev. John Nobili, S.J., the Nobili Club is the official language club on the campus. Its purpose is twofold: First, it aims to foster among the students interest in the countries and civilizations which

have contributed to the culture of the world. Secondly, it supplements the academic language courses and encourages interested students to pursue more intensively this study of the ancient and modern languages.

DRAMATICS

An exceptionally high standard of dramatics has been set at Santa Clara from the beginning. Earliest records show that classical productions were quite the accepted thing even in the fifties, nor have traditions changed. In consequence of this, students acquire a rare facility of expression and unusual ease in public appearances.

Each year a major dramatic production is staged, giving opportunity to a large proportion of the student body to participate. In the past these productions have included such notable performances as "The Mission Play of Santa Clara" and "The Light Eternal" by Martin V. Merle '06, and "The Passion Play of Santa Clara" and "The Weaver of Tarsus" by Clay M. Greene, '69.

DEBATING

The standard of debating is on a par with that of dramatics. In addition to the various debating societies intercollegiate debates are arranged each year with representative colleges and universities.

The Literary Congress held its first meeting on February 22, 1857, and has since then furnished its members an opportunity for exercise in debating and other forms of public speaking. It consists of two Houses, the **Philalethic Senate** and the **House of Philhistorians.**

The Stephen M. White Debating Society, established October 14, 1922, has for its object the fostering of debating and public speaking among Freshmen in the College of Liberal Arts.

MUSIC

The University Band and Orchestra furnish their members with the opportunity for ensemble playing at the public exercises of the University.

The University Choir and Glee Club furnish vocal music for Chapel services and the public exercises of the University.

PUBLICATIONS

"The Santa Clara." The "Santa Clara" is the official weekly newspaper of the University. The aim of the "Santa Clara" is: To publish the news of the University, to aid in constructive work, and to afford the students of Journalism an opportunity for actual practice in newspaper editing, managing and make-up.

The "Redwood." The "Redwood" is the University annual published by the students to serve as a medium for literary work of more than passing merit, as a record of University activities, and as an expression of the student life of the University.

The "Owl." The "Owl" is the monthly literary supplement of the "Santa Clara." This publication offers a medium for literary work among the students. The name was taken from the first literary magazine of the University.

ATHLETICS

Athletics at Santa Clara are under faculty control through the Board of Athletic Control and the Faculty Moderator, by whom arrangements for intercollegiate and intramural contests are made.

In direct charge of Athletics and Physical Training is the Director of Physical Education, who is assisted by professional coaches in the various major activities.

Block S. C. Society. Members of the University teams who have secured the University letter are organized into the Block S. C. Society in recognition of their athletic ability and for the encouragement of a high standard of athletic conduct.

The Athletic Managers Association is composed of volunteers from each class who cooperate with the management in the conduct of games and the care of equipment.

AFFILIATED ORGANIZATIONS

The Faculty Club. This is an organization of the religious and lay members of the Faculty, organized as a means to become better acquainted with the problems confronting the various departments and to mould the Faculty into a solid working unit. Educational, scientific and ethical problems are discussed by the members. Men of prominence in public affairs as well as educators from other universities are invited from time to time to address the Faculty Club on subjects of particular interest.

Alumni Association. The object of this association is to strengthen and perpetuate college friendships, to preserve in former students a warm regard for Alma Mater and a lively memory of the substantial benefits she has bestowed, to cherish and advance her interests, to maintain her honor and sustain her reputation by manly and honorable conduct. Officers of the Association are:

John M. Burnett, '25, President
Paul Leake, '12, First Vice-President
Arthur H. Kenny, '39, Second Vice-President
John A. Cronin, '20, Third Vice-President
Richard J. Lautze, '39, Treasurer
Joseph C. Tobin, '40, Secretary

PRIZES

The following extraordinary prizes are open to competition on the dates announced in the University Calendar. The Faculty Committee on Scholastic Standing reserves the right not to award any of these prizes in the absence of sufficient competition or a meritorious grade of scholarship. No one is eligible to compete a second time for a prize which he has already won, except after an interval of one year. Students who have not been in attendance for both semesters may not compete.

Nobili Medal. An annual prize of $60 founded by Joseph A. Donohoe, Esq., in honor of the first president of Santa Clara, Rev. John Nobili, S.J., to be given to the student who shall be deemed first in morals, obedience and application to study.

Two Silver Medals to be given to the following students who become most distinguished for good conduct and application to study:

1. The most distinguished **Resident** student.
2. The most distinguished **Non-Resident** student.

The Religion Prize. A purse of fifty ($50) dollars, given by the President of the University (1950), to be awarded annually to an upper division student, for proficiency in religion, selected on conditions set down by the Religion Department.

The Michael Shallo Prize in Philosophy. A purse of fifty ($50) dollars donated by the President of the University (1950) for the student selected by competition as most proficient in Philosophy.

The Ryland Prizes. The Hon. Caius T. Ryland founded in 1897 an annual purse of $45.00, leaving its disposition to the discretion of the Faculty. This the Faculty, after due consideration, assigned to the University Literary Congress, organized February 22, 1857, establishing the Ryland Debate to be held yearly between the two branches, the Senate and the House, and divided the purse into three prizes of $20.00, $15.00 and $10.00, respectively. By an agreement between these societies, each in turn selects the subject to be debated, and the other is granted the choice of the side it will defend.

The McCann Prize. Annual prize of $25.00 founded in honor of Daniel B. McCann, B.S., '84, to be given for the best short story.

The Redwood Prize. Annual prize of $25.00 founded in 1908 by the executive committee of "The Redwood," and given for the best essay on an historical subject.

The Owl Prize. An annual prize of $25.00 founded by the directors of the former College Magazine, "The Owl," to be given to the winner of an oratorical contest in the University.

The William H. Leahy Prize. A gold watch, valued at $50.00. This prize was founded in honor of Mr. William Leahy by his wife and his brother, Mr. James Leahy, for the winner of the Dramatic Art Contest.

The Handlery Prize. An annual prize of $50.00 founded by Mrs. Rose Handlery in honor of her son, Raymond, of the class of 1934 to be given to the Senior student of the University who will have contributed most to the success of any of the University student publications.

The Orella Prize. An annual award of $25.00 established in 1915 by the late Dr. Firmin R. Orella, B.S. '89, and founded in 1945 by his wife, Albertine S. Orella, to be given to the senior student in the Department of Science who attains the highest average in scientific subjects during the junior and senior years.

The Coolidge Prizes. Two gold medallions to be given to the winners of the annual Coolidge Competition, the public Moot Court session of the College of Law.

The Chargin Prize. An annual prize of $50 to be given, in honor of Mr. and Mrs. Joseph A. Chargin, Sr., to the senior in the College of Law who has maintained the highest class average throughout his law course.

The Bancroft-Whitney Company Prize. A set of law books awarded to the member of the senior class in Law having the highest average.

Business Administration Prize. An engraved key given by the Business Administration Association to the senior in the College of Business Administration with the highest scholastic average.

ADMISSION TO THE UNIVERSITY

Those who wish to apply for admission to the University should proceed as follows:

1. Secure an application form from the office of the Registrar either by mail or by calling at the office. This should be done in the Fall preceding the desired Fall date of entrance.

2. Send the filled out application to the office of the Director of Admissions in February preceding the desired Fall date of entrance, to-

gether with the matriculation fee of ten dollars ($10.00).

3. Request all high schools or colleges previously attended to send directly transcripts of completed preparatory work. These records should be prepared and sent to the Director of Admissions during February or March.

4. Two testimonial letters certifying to the good moral character of the applicant should be sent also in February or March.

No application for admission can be considered until the applicant has complied with all four points above.

Scholarship Credentials

Candidates for admission to any of the undergraduate courses of the University must qualify:

(a) For admission to Freshman standing:
By presenting evidence of graduation with better than average grades from the regular four-year high school course of the Preparatory Department of this University (Bellarmine Preparatory School, San Jose), or of a similar course in an approved high school.

(b) For admission to the undergraduate course of his choice:
By presenting high school courses in accordance with the appropriate pattern indicated below:

	A.B.	B.S. B.S.C.	Engrg.
English	3	3	3
Latin*	4		
Greek*	2		
Foreign Language*		2	2
Algebra	1	1	2
Geometry	1	1	1
Trigonometry			½
History	1	1	1
Laboratory Science	1	1	2
Optional, advanced course in Foreign Language, Mathematics or Laboratory Science	1	1	

*Students entering with only two units of Latin for the A.B. course will be given an opportunity to make up these deficient units for credit during the first two years of college. Students who in rare cases are accepted without two years of Foreign Language (these units must be in the same Foreign Language) will be given an opportunity to make up these deficient units but for no credit towards their degree.

It is strongly recommended that the unprescribed units be in Mathematics, Languages (preferably Latin), Laboratory Sciences, or Social Studies.

No credit is ordinarily allowed for physical education or music. One unit each may be accepted for commercial subjects, vocational subjects, and mechanical drawing.

Half units will be accepted only when presented in addition to integral units in the same subject or in half year subjects which constitute a complete course in themselves, e. g., Solid Geometry. Any two of the biologi-

cal sciences (Physiology, Botany, Zoology) may be combined into a continuous year's course equal to one unit.

The University reserves the right to require entrance examinations in the case of applicants whose certificates show grades below 80% in the prescribed units. Admission on school certificates is in all cases provisional and if, after admission, a student fails in any subject for which a school certificate was accepted, credit for that entrance subject may be cancelled.

A matriculation deficiency in a subject continued in the University in which the deficient student attains a grade of C (77-84), may be removed by the proper faculty, on the recommendation of the professor. Students, however, are cautioned not to assume in advance that this will be done.

Examination in Subject A

All lower division entrants in the colleges at Santa Clara must, at the time of their first registration in the University, take an examination, known as the Examination in Subject A, designed to test their ability to write English without gross errors in spelling, grammar, diction, sentence structure and punctuation.

The examination in Subject A will be given within two weeks after the opening of each semester. The papers submitted in the examination will be rated as either "passed" or "not passed." Any student who is not present at the examination in Subject A which he is required to take will be rated the same as those who have not passed the examination.

All students who do not pass in the examination in Subject A will be required to take, immediately after their failure, a course of instruction known as the Course in Subject A, without unit credit toward graduation. This course will be given each half year two hours a week for the semester, beginning one week after the examination. Every student who is required to take the course in Subject A will be charged a fee of $5 and the charge will be repeated each time he takes the course.

Admission to Advanced Standing

Admission to advanced standing is by specific action of the Committee on Credentials and Registration, which will evaluate all credits presented and determine the rating of the candidate.

Students from other institutions of recognized collegiate rank, including Junior Colleges with well established courses, may be admitted to such standing and upon such terms as the Committee shall deem equitable. Every such candidate is required, besides the prescribed testimonials of character and scholarship, to present a catalogue of the institution in which he has studied, and a full statement, duly certified, of the subjects he has therein completed and of the subjects there presented for entrance. The University reserves the right to determine after a test of at least one semester the amount of credit that the applicant may receive, and meanwhile he shall have the status of an unclassified student.

Admission of Special Students

Candidates for admission as special students must be persons of mature age who desire to take up special work in one department or in one subject with its related branches. Such special students are not candidates for a degree, but they may become candidates by satisfying the requirements for a regular course. No one will be admitted directly from a secondary school to the status of a special student. Entrance examina-

tions in the subjects of fundamental importance for the work proposed will be assigned in practically all cases. Registration as a special student is for one semester only and no one may register for less than ten hours. Re-registration will be refused if the student has not shown earnestness and definiteness of purpose or if his work has been unsatisfactory in whole or in part.

Admission of Foreign Students

Candidates for admission who come from foreign countries must present original and complete educational credentials, together with a catalogue giving full description of the courses. Provisional registration may be then given pending verification of the record and until the student concerned has successfully completed one semester's work of not less than twelve hours, when permanent matriculation may be given. Students from other than English-speaking countries must, in addition, possess sufficient knowledge of English to carry satisfactoritly their class work.

REGISTRATION

Directions for registering are mailed to each applicant with his letter of acceptance.

The committee on admissions acts on applications for entrance to the University during the early Spring and will notify at that time by letter all accepted applicants.

Candidates, upon receipt of final notification of the acceptance of their applications, are obliged to forward a guarantee fee of fifty dollars ($50). This is not an additional charge, but will be credited to the student's account after registration. It will be forfeited only if the student fails to register without giving the University three (3) weeks advance notice. Students who have already submitted a matriculation fee with their application need pay only the forty dollars ($40) additional.

Due to the fact that registration in the separate colleges of the University is limited, each acceptance is for a specific college, hence, a student will not be permitted to register in any college except the one for which he has been accepted. Any student who desires to change his course or to cancel his reservation must do so prior to three (3) weeks immediately preceding the day of registration.

Before registering for instruction in any department, the student must obtain a card signed by the Treasurer of the University, showing that a satisfactory settlement of his account has been made. This card is handed to the Registrar, from whom the student will receive his registration forms.

RELIGIOUS TRAINING

To cultivate the heart, no less than to develop the intellectual and physical faculties of the student, is a duty kept constantly and sacredly in view.

As the Faculty of the University profess the Catholic religion, the exercises of religious worship are Catholic; but members of any religious denomination are received, provided they be willing, for the sake of order and uniformity, to conform respectfully to the religious observances of the University. All students are required to attend chapel lectures and the lectures of the annual Retreat.

The University authorities are convinced that without religion there can be no education in the truest sense of the word, that is to say, no

complete and harmonious development of the intellect and heart of man. They hold, furthermore, that religious truth, being definite and certain, may be taught with as much exactness as language or any other branch. Accordingly the study of Christian Doctrine is required of every Catholic student, and two periods weekly are devoted to it in every class of every course. One unit per semester is allowed for this work. Students who are excused from taking Religion courses, must present an equivalent number of units in another field in order to meet the graduation requirement of their College.

STUDENTS' HEALTH SERVICE

The University exercises supervision over the health of students. Though a certain degree of sickness is inevitable among so many, its percentage is very slight. A physician is in daily attendance at the University without extra charge for minor cases. A certificate of health, either from the home or from the resident physician, is required of each student. Wholesome food, regular hours for rising and retiring, excellent climate and ample opportunity for outdoor recreation, all combine to improve the general health of the students who are registered at Santa Clara.

Students who have not submitted a certificate of health before registration are required at the time of registration to undergo a physical examination under the supervision of the University physicians. Moreover, in accordance with the recommendation of the State Board of Health all students must present a certificate of vaccination or be vaccinated by one of the University physicians.

The University assumes no responsibility for injuries sustained by any student during play, in the swimming tank, in the gymnasium, or during athletic contests.

MILITARY SCIENCE

The University maintains a Senior Division Unit of the Reserve Officer's Training Corps, Artillery Branch, whose mission is to produce junior officers who have the qualities and attributes essential to their progressive and continued development as officers in the Army of the United States. The course comprises a two-year basic course and a two-year advanced course.

All undergraduates are required to take the two-year basic course unless exempted by the Professor of Military Science and Tactics. All students at the time of initial entrance to the University must report to the Military Department for enrollment in military training.

Exemptions from military training may be granted in the following cases:

1. Veterans of the Armed Services of World War II.
2. Students having reached the age of 23 years at time of initial registration in the University.
3. Physically disqualified as certified by the University Physician.
4. Non-citizens of the United States.
5. Students whose military training at other universities or military academies is accepted by the Professor of Military Science and Tactics as fulfilling the requirements.
6. Students entering the University after having attended another institution of like standing for a period of two or more years.
7. Students who hold or formerly held a commission in the Armed Services.

Petitions for exemptions from, or deferment of, military training will not be received after enrollment in military courses, except for physical disability occurring following enrollment.

Students exempted from military training must offer an equal number of units of other work in lieu of military science and tactics in order to receive a degree. Selection of these courses must be approved by the Dean of the College in which the student is registered.

Admission to the advanced course will be voluntary on the part of students under 27 years of age who have completed the two-year basic course or whose military training otherwise qualifies them to pursue the advanced course.

Students who meet the above requirements will be selected by the Professor of Military Science and Tactics and the President of the University for enrollment in the advanced course under a quota set up by the Department of the Army.

Advanced course students are under contract with the Government to complete the advanced course training unless sooner discharged for the convenience of the government and will be paid a monthly monetary allowance at a daily rate equal to the value of the Army ration for a period of not in excess of 570 days.

Advanced course students are required to attend one summer training camp of six weeks duration and will be paid at a rate prescribed for a soldier of the 7th grade and in addition will be allowed travel rate of 5 cents a mile to and from camp.

Students who complete the advanced course are eligible for appointment and commission by the President of the United States as an officer in the Reserve Corps, U. S. Army.

Students who desire a commission in the Regular Army may elect, upon appointment as an officer in the Reserve Corps, to serve a tour of active duty with the Army and to be commissioned in the Regular Army on a competitive basis. Or, a student who has received his academic degree and has been designated by the President of the University and the PMST as a "distinguished military graduate" may, upon application, be commissioned directly in the Regular Army.

The Professor of Military Science and Tactics may grant certificates of eligibility for entrance to an officer candidate school course to those especially qualified students who may be called to service in the U. S. Army and who have completed the military course, together with 2 years of college studies.

Uniforms and text books are furnished by the Government without cost to the student.

The deposit required of all basic students is to protect the University for loss of or damage to the Government property entrusted to students. At the end of the school year, or if the student leaves the University prior to that time, all Government property including texts will be returned to the Military Department. Any loss or damage to equipment must be paid for by the student.

DISCIPLINE

"To mould men after the model of the Man-God, and thus form them to serve their fellowmen, their country and their God; this is the ideal and the purpose of the University of Santa Clara."

Santa Clara feels that the above ideal and purpose cannot be attained unless her students are well trained in the fundamentals of refinement, considerateness and restraint early in their careers. Christian civil society is definitely formed on the principle that we have obligations to our fel-

lowmen, our country and our God. Where so many live so closely together as do the students at Santa Clara, it becomes necessary that certain regulations be set down to accomplish more easily the purpose toward which we are aiming. These regulations are not drawn up with the idea of restricting one or making life difficult; they are given as means of establishing good order, avoiding injustice or inconvenience to others, and insuring a situation conducive to study—the purpose for which students are attending the University of Santa Clara.

All matters pertaining to discipline are under the general direction of the Vice President of the University.

Students who are not Veterans and whose homes are not in the neighborhood of the University must reside on the Campus.

Students' correspondence is subject to inspection by the President of the University or by some member of the Religious advisory board appointed by him.

The following violations render those involved liable to expulsion:

1. The holding of meetings or forming of Clubs or Societies of any kind without the consent of the President.
2. Gambling, intoxication, the bringing of intoxicating liquors on the University premises or the patronizing of places where liquor is sold.
3. Absence from the University at night without permission.
4. Possession or circulation of any books or writings of an immoral nature or obscene pictures.
5. Habitual obstinancy, insubordination, impertinence or any other character defect, because of which a student may be considered by the University as undesirable.

It is strictly forbidden for any student or group of students to haze any other student or subject him to any personal or physical indignity or treat him in such wise as may reasonably give offense.

Parents are requested not to call their sons home at other times than the Holidays provided for in the school calendar because such interruptions prevent the acquiring of habits of concentration and persevering work, also such interruptions are apt to result in poor scholarship and to interfere seriously with the students' entire scholastic training.

After the Summer vacation, Christmas Holidays or other Recesses allowed by the President, students must report back to the Universtiy on the day appointed for Registration and the reopening of classes. Absence at these times may result in fines, deprivation of privileges or, at the discretion of the Faculty exclusion from the University. The minimum sanction for late registration is $2.50 for the first day and $1.00 for each day thereafter. Registration is not completed until a student has attended classes.

The University reserves the right to dismiss at any time a student who fails to give satisfactory evidence of earnestness of purpose in the serious work of college life. Dismissals may be made without specific charges, and, in some cases, perhaps on grounds that seem insufficient to students and parents. The University in these cases holds itself to be the more capable judge of what affects the interests of the institution and the student body.

Any student who wishes to keep his automobile on University premises must register the automobile with the Vice President of the University and must observe regulations established for traffic on the campus.

Eligibility Rules

Except where otherwise specifically provided for by the Faculty, students taking part in public debates, oratorical or dramatic art contests or representing any department of the University in inter-collegiate athletic events, as well as all those who are appointed on the staff of the university publications or as officers of student organizations, or are elected as captains or officers of any society, are subject, at the time of their selection or appointment, to the following eligibility rules: (1) They must have no conditions or failures; (2) They must have attained a weighted average of C (77-84) in the last mid-term or semester examinations; (3) They must not be under censure.

Any student admitted to the University on a scholarship or as a student worker who fails to obtain a semester average of C (77-84) in any of his subjects forfeits his right to his position or scholarship.

The registration of a student is deemed a recognition on his part and on the part of his parents or guardians of compliance with all the rules and regulations of the University, and acceptance of all conditions laid down in the catalogue.

Withdrawal From the University

When a student is to be withdrawn from the University either temporarily or permanently the Vice President of the University must be informed directly by either a parent or guardian. The student should then report to the Registrar for the Withdawal Form.

Scholarship

Regular work for Freshmen is **sixteen hours** per week. For all others it may be from **fifteen** to **eighteen** hours. Candidates for a degree will not be allowed to register for fewer than twelve hours of work.

No Freshman may register for more than **sixteen and one-half** credit hours (except in the College of Engineering, or Science majors in the College of Arts and Sciences) without special permission from the Dean of his college.

In the case of students of longer attendance, the Dean may grant permission to take studies up to **eighteen** credit hours a week, after the standing of the student in each study of the previous semester is examined and found to be B (85) or over. On the other hand, students carrying more than the normal amount of work who fail to maintain a standard of C (77-84) in all of their courses, may be restricted by the Dean to the normal number of units. Even if, because of the difficulty of making the desirable courses total the exact limit, a student is permitted to carry a study-list slightly greater than the limits here set, or if a student transfers from another college where a greater study-list is permitted or required, the credit toward the degree will be limited strictly according to this rule.

Quality of Work

A student's grade of scholarship is given according to the following schedule:

Above passing:	Below passing:
A (93-100), Excellent	E (60-69), Conditioned
B (85-92), Good	F (0-59), Failed
C (77-84), Fair	I, Incomplete
D (70-76), Passed	W, Withdrawn

Conditions

Where a student is conditioned at the end of a semester, he will be permitted to remove the condition at the time set for the examinations for the removal of conditions.

Where a student is conditioned in a written or oral examination, given at the end of the school year, he will not be re-examined until the beginning of the next school year.

Where a student has been re-examined in any subject to remove a condition or reach a certain average, another examination may be permitted in the discretion of the Faculty; but in no case may it be taken until two months have elapsed since the former examination. If the student fails to reach the required average no further examination will be allowed.

Failures

A grade of F (0-59) at the close of a semester indicates a failure. A failure in a subject means that the student must repeat the work in class the next time it is given. A student who fails in two subjects may be excluded from the University.

A conditioned student who fails to pass a satisfactory examination at the time set for condition examinations receives a failure in the subject, unless, on recommendation of his professor, the Faculty shall permit him to review a subject in which he is thus deficient with the assistance of an acceptable private tutor; in which case he will be excused from attending the recitations, but will be required to take the regular examination at the end of the year or half-year.

If the condition is received in a laboratory course, the student must make up the work in which he is deficient before the time of the condition examinations or receive a failure.

Probation

A Freshman who, in his first semester, fails to attain a grade point average of 0.70 or in his second semester fails to maintain a grade point average of 1.00 for the year will be put on probation.

A Sophomore who fails to maintain an average of 0.80 after the first semester of his sophomore year will be placed on probation. If he is already on probation because of unsatisfactory work in his Freshman year he may be placed on second probation only if there is good reason to expect that he can improve his over-all average sufficiently to be eligible for admission into the upper division.

All students to be eligible to advance to the upper division of their college must have a grade point average of 1.00 at the end of their Sophomore year.

Juniors and Seniors who do not maintain a 0.80 average in each semester will be put on probation.

The grade point average is the number of grade points earned divided by the number of unit hours passed.

Probation continues through an entire semester. A student who is on probation will not be permitted to represent the University in any activity.

Exclusion for Poor Scholarship

If in the opinion of the Dean, a student's work is so poor as to justify the action, or if it is reasonably certain that he does not possess the

qualifications necessary for success in the particular field or profession to which he aspires, such student may be required to withdraw because of poor scholarship. A Freshman who, in his first semester, fails to attain a grade point average of 0.40 or, in his second semester, fails to attain a grade point average of 0.70 will be required to withdraw from school.

Re-instatement

A student who has been dropped from the University for poor scholarship may not be readmitted, except after the lapse of one semester and through the special action of the Committee on Admissions. If he spends the intervening semester in another institution, he must present a weighted average of "C" for a full schedule in the other institution. His status on readmission will be probation.

Attendance

Any student who, during a Semester, has been absent from a class more than twice the number of times that class meets per week is ineligible to take the final examination in that subject, and fails the course, unless the Committee on Scholastic Standing deems his case worthy of exception. If, however, the number of UNEXCUSED absences in any subject should exceed the number of class periods per week in that subject exclusion from the final examination will be automatic and no appeal will be allowed.

Written Examinations

Written examinations are held every six weeks in all subjects and in all departments. They are also held twice a year upon the work done during the preceding semester. After each examination, a report on the progress of the student is prepared by the Registrar's office and mailed to the parent.

A student guilty of dishonesty in examination will forfeit the credit for the respective course. In special cases and on advisement, the faculty may impose a penalty involving even dismissal from the institution.

General Requirements

In order to be accepted in fulfillment of any requirement for a degree, all work must be completed with grade D (70-76) or over, and the general average of the work must be of grade C (77-84) or above but work in the major field, including sophomore pre-requisites, must be completed with a grade of C or over.

Special regulations as to the grades to be maintained by law students and candidates for degrees will be found under "College of Law, Graduation."

Amount of Work

In order to receive a degree, a student is required to complete the requisite number of semester hours and secure an equal number of credit points, i. e., an average rating of C grade or better in all subjects.

A semester hour is the standard for computing the amount of a student's work. A semester hour is defined as one lecture or recitation one hour in length per week for one semester. Three hours of laboratory work are equivalent to one recitation hour. Two hours of preparation on the part of the student are required for each hour of lecture or recitation.

Credit Points

A candidate for a degree must gain not only the number of credit hours required, but his work must reach a certain standard of excellence. In addition to the required number of credit hours necessary for graduation, each student must earn an equal number of credit points, or an average mark in all subjects of C or better.

For a grade of A in a given course a student will receive three times as many credit points as there are credit hours in that course; for a grade of B, twice as many credit points; for a grade of C, as many credit points as credit hours; while D gives credit hours but no points. For every failure at the end of the semester, one credit point per credit hour is to be deducted from the total number of credit points that could otherwise be gained. Such lost points cannot be made up by repeating the course, even though the credit hour in such cases will count toward the total number of credit hours required for graduation.

For example: A four hour course in which the student receives the grade of A gives 12 credit points; if the grade is B, 8 credit points; if C, 4 credit points; if D, no credit points. If the grade is F, four credit points are deducted.

Thus, in a course where 128 credit hours are required for graduation, the maximum number of credit points that can be secured by a student is 384; the minimum, 128.

Candidates for graduation must attend any course of lectures or any other exercises that have been or may be authorized and equipped by the Faculty, even though such courses receive no value in credits.

No student will be advanced to full junior standing who has less than 64 credit hours and 64 credit points by the end of his sophomore year.

Electing Studies

All students must inform the Dean of the College in writing as to their choice of subjects, and no one may enter upon a course or relinquish one already taken up without his advice and consent, upon penalty of receiving no credit in the first case, and a failure in the subject abandoned, in the second. All such approved changes in study lists must be reported by the student to the office of the Registrar.

Changing of College or Major

No student may expect favorable action on a request to change from one college to another unless he is able to present at the time of change an over-all C average. This will not be true when a student wishes to change from one major to another within the same college. A student who wishes to request a change must file a petition with the registrar two weeks before the end of the semester. If a minor, a student must present written consent of parent or guardian.

Candidacy for Degree

Every student who wishes to become a candidate for a degree in any College of the University must, at the beginning of his senior year after consulting the Dean of his College, file with the Registrar a written statement of the degree to which he aspires and the work which he proposes to do. He will then be informed whether he may be admitted as a candidate for such degree and whether the work proposed is satisfactory. Any change of purpose must be similarly announced and approved.

COURSES, UNITS

Courses in the University are divided into three groups. The Lower Division, comprising the studies in the freshman and sophomore years; the Upper Division, comprising the studies in the junior and senior years, and leading to the Bachelor's degree; and Graduate Courses, comprising graduate studies, and leading to advanced degrees. (No graduate courses are being given at the present time.)

Courses in the Lower Division are numbered from 1 to 100. Courses in the Upper Division are numbered from 101 to 200. Courses for Graduate students are numbered from 201 up. Under certain conditions Lower Division courses may be taken for Upper Division credit, but in such cases it is expected that a higher standard of work shall be done and the instructor will assign additional work for such students. Upper Division subjects may be taken for Graduate credit under such conditions as may be prescribed by the Dean of the Faculties and the professor in charge.

RECOMMENDATIONS TO OTHER SCHOOLS

No student will be recommended for entrance into any other university or college who has not maintained an average of B (85-92) in every subject throughout his course.

Students wishing Transcripts of Record in order to transfer to another school or for any other purpose should make early and seasonable application for the same. No such statements will be made out during the busy periods of examination and registration. Credentials which are accepted for admission become the property of the University and are kept permanently on file.

SESSIONS

The first semester begins in September and ends about the end of January.

The second semester begins in February and ends about the third week of June.

As in most departments of the University new courses are not begun in February, students desiring to matriculate at the beginning of the second semester can only be received on condition that they are prepared up to the point then reached by the class which they desire to enter.

Summer School Courses

The University is not conducting Summer Sessions at the present time. Students planning to attend Summer Sessions at other institutions should if they wish to receive credit for their courses secure in advance, from the Dean of their College, written approval of the College or University they wish to attend and the specific courses they wish to take.

No credit will be allowed for any summer course completed with less than a grade of "C". Moreover, the Dean of the College may require an examination to certify the grade in any summer course.

COLLEGE OF ARTS AND SCIENCES

CURRICULUM

The curriculum of the College of Arts and Sciences extends over a period of four years and comprises courses of study selected with special regard to their cultural value. It assumes that the essence of education is concerned with the physical, mental and moral development of the whole man and that specialization in particular fields should rest upon the foundations thus laid. For this reason the curriculum of the College of Arts and Sciences insists on the advantage of a prescribed training in the humanities, rhetoric, mathematics, natural sciences, religion and philosophy. In the final two years concentrated work is offered in the fields of Classical Languages, Economics, English, History, Philosophy, Political Science, Biology and Chemistry.

ENTRANCE REQUIREMENTS

To qualify for Freshman standing in the College of Arts and Sciences, applicants must be graduates of an accredited high school and must present no less than sixteen units including the following:

English	3 units
Foreign Language (One Language)	2 units
Mathematics (Algebra and Geometry)	2 units
History	1 unit
Laboratory Science	1 unit
Optional, advanced course in Foreign Language, Mathematics or Laboratory Science	1 unit

The remaining six units should be in solid college preparatory subjects rather than in the terminal and industrial courses. Additional courses in Foreign Language, Mathematics, Science, English and Social Studies are recommended.

The quality of the grades presented for entrance to the College of Arts and Sciences must be above average. In view of the fact that a C average is required to remain in the College or to receive a degree, it is obvious that something better than a C average should be presented for entrance. Grades of D cannot be accepted in fulfillment of the requirements for entrance to College.

Students presenting only two years of Language at entrance may graduate with the degree of Bachelor of Arts by electing three years of Latin in College in addition to two years of Greek or a Modern Language. Students presenting four years of Latin and two years of Greek at entrance may graduate with the degree of Bachelor of Arts by electing two years of Latin in College.

All candidates for a Bachelor's degree are required to present sixteen units of Foreign Language. When two years of Foreign Language (these must be in one Foreign Language) are presented at entrance, four units are allowed, and twelve units (or two years) are required in College. Not more than two Foreign Languages may be presented in fulfillment of the Language requirement.

Students planning to major in Science in College should present at entrance to College no less than two Sciences (Chemistry and Physics),

and not less than three years of Mathematics (including Intermediate Algebra and Trigonometry).

DEGREES

The College of Arts and Sciences confers the degrees of Bachelor of Arts, and Bachelor of Science.

The Bachelor of Arts degree is conferred on those students who, presenting at entrance four credits in Latin and two credits in Greek, complete two more years of Latin in college in addition to the other requirements of the major of their choice. Students entering without the prescribed amount of Latin and Greek but who have had at least two years of credit in Latin may be permitted to make up the deficiencies during their college course.

The Bachelor of Science degree is conferred on those students who, substituting modern language for Latin and Greek, complete the requirements for any of the majors offered other than Philosophy.

THE PRE-MEDICAL AND PRE-DENTAL COURSE

Students entering the College of Arts and Sciences with the purpose of later going on to the study of Medicine satisfy all the requirements prescribed by the Council on Education of the American Medical Association by following the major in Biology. The curriculum is so arranged that the student may comply with the requirements for entrance to Medical schools in three years. However, because the number of medical applicants is growing each year, few medical schools now admit students without a college degree. It is therefore recommended that Pre-Medical students spend four years in their preparation and add such cultural courses to their schedule as will better fit them to pass with success through the vast field of experiences which await the physician in the practice of his profession. In this course all requirements for entrance to standard Dental Schools are met.

DIVISIONS OF THE COLLEGE

The college recognizes a lower and an upper division. The work of the lower division comprises the studies of the freshman and sophomore years. The completion of the lower division is a prerequisite for admission to the upper division. For any degree a minimum of 128 units is required, 64 of which the student will normally take in the lower division and 64 in the upper. Each unit represents one hour of the student's time at the University weekly, during one-half year, in lecture or recitation, together with the time necessary in preparation therefor, or a longer time in laboratory or other exercises not requiring preparation.

No student may register for more than sixteen hours without special permission of the Faculty, and such registration is not allowed to any student in his first semester of residence, except approved Science majors. After one semester of regular work, students beyond freshman may receive permission to take not more than eighteen units per semester, provided they have attained a weighted average of at least B (85-92) the preceding semester. On the other hand, students carrying more than the normal amount of work who fail to maintain a standard of C (77-84) in all their courses may be restricted by the Dean to the normal number of units. Even if, because of the difficulty of making the desirable courses total the exact limit, a student is permitted to carry a study-list slightly greater

than the limits here set, or if a student transfers from another college where a greater study-list is permitted or required, the credit towards the degree will be limited according to this rule.

LOWER DIVISION

In the lower division it is expected that the student, in addition to fulfilling the prerequisites for the major work upon which he will concentrate in the upper division, will make an effort to establish a basis for that breadth of culture which will give him a realization of the methods and results of some of the more important types of intellectual endeavor, and a mental perspective that will aid him in reaching sound judgments. The lower division requirements were designed to provide in some measure for the accomplishment of this purpose, without unduly limiting the student's opportunity to satisfy his individual tastes and preferences.

Certain courses taken in the high school are accepted as fulfilling in part or in whole some of these lower division requirements. It is desirable that the student should so arrange his high school program as to reduce the required work in the fields of foreign languages, mathematics and the natural sciences. This makes his program more flexible, gives him greater freedom of choice, and prepares him to pass more quickly into advanced work or into new fields of study. In no case, however, does the satisfaction of lower division requirements in the high school reduce the amount of work required in the lower division or for the degree, The lower division work presupposes the prescribed entrance requirements, the successful completion of Subject "A" and the specified requirements in the respective courses.

Pre-legal requirements are met by students following the regular courses in the College of Arts and Sciences.

UPPER DIVISION

Only those students who have completed the lower division requirements will be registered as regular students in the upper division.

Degrees in the College of Arts and Sciences will be granted upon the following conditions:

1. The total number of units in college courses in the lower and upper divisions must be at least 128.

2. After fulfilling the requirements of the Lower Division 60 units are required in the upper division, 40 of which must be from listed upper division courses. Where lower division units are taken for upper division credit both the quantity and quality of such work must conform to upper division standards.

3. Candidates for graduation must complete a major of 24 upper division units in either Classical Languages, Philosophy, Economics, English, History, Political Science, Chemistry or Biology. Not more than thirty upper division units, however, should be taken in the major field.

4. In addition to the units in the major chosen, a minor of 12 units in a specific department must be offered. For those choosing a major other than Philosophy a minor in Philosophy will be prescribed.

5. Candidates for a degree must submit a thesis on their major or some cognate subject. The thesis shall consist of not fewer than 5000 words and shall be typewritten on National White unruled paper 8½ x 11 inches.

The subject must be submitted to the Dean of the College for approval and the thesis itself handed in completed according to the dates stated in the current calendar. The presentation of an acceptable thesis is an absolute prerequisite for admission to final examination. The ultimate decision as to whether the effort merits the certificate or degree rests with the Committee on Theses.

6. Residence of at least one year immediately preceding graduation is required for the granting of any degree.

Graduation Honors. A candidate for an undergraduate or professional degree who has a grade point average of 2.40 graduates **Cum Laude;** one who has a grade point average of 2.65, **Magna Cum Laude;** and one who has a grade point average of 2.85, **Maxima Cum Laude.**

Graduation honors are based on the work of the four years.

The University reserves the right to exclude from graduation honors students who have been subject to disciplinary probation, or who, in the judgment of the Committee on Honors, are lacking in acceptable qualities of character or good citizenship. The work of transfer students will be interpreted in terms of the grades of this University.

Electives. Courses not taken as prescribed courses and not included in the students' major and minor sequences may be chosen as free electives to complete the 128 units required for graduation.

SUBJECT REQUIREMENTS

(a) Prescribed subjects for the A. B. degree:

	Credit Hrs.		Credit Hrs.
English	12	History	6
Latin	12	Logic	3
Science	8	Metaphysics	12
Public Speaking	2	Ethics	6
Religion	8	Mil. Sc.	6

(b) Prescribed subjects for the B. S. degree:

	Credit Hrs.		Credit Hrs.
English	12	Public Speaking	2
Modern Language	12	Logic	3
Science	8	Metaphysics	12
History	6	Ethics	6
Religion	8	Mil. Sc.	6

Students who have received the Junior Certificate in other institutions must secure before graduation all the prescribed credits, except those in Science and Lower Division Philosophy. In place of these they may offer such electives as are approved by the Dean.

The prescribed courses in Religion will be required only of Catholic students.

PLANNED CURRICULA

Following are examples of planned curricula for the various subjects in which an opportunity for major study is offered in the College of Arts and Sciences.

A CURRICULUM FOR BIOLOGY (PRE-MEDICAL) MAJORS

Freshman

Fall Semester	Units	Spring Semester	Units
Engl. 1A (English Composition)	3	Engl. 1B (English Composition)	3
Psychology I (General Psychology)	3	Phil 9 (Logic)	3
*Language (Foreign Language)	3	Language (Foreign Language)	3
Chem 1A (Inorganic Chemistry)	5	Chem 1B (Inorganic Chemistry)	5
Math 1 (Algebra)	3	Math 2 (Trigonometry)	3
Rel 1 (Apologetics)	1	Rel 2 (The Church)	1
Mil Sci 1 (Basic Course)	1½	Mil Sci 2 (Basic Course)	1½
	19½		19½

Sophomore

	Units		Units
Phil 21 (Philosophy of Nature)	3	Phil 22 (Philosophy of Mind)	3
Biol 21 (General Zoology)	4	Biol 22 (General Zoology)	4
Chem 14 (Quantitative Analysis)	3	Chem 54 (Physical Chemistry)	2
Language (Foreign Language)	3	Language (Foreign Language)	3
Pub Spk 1 (Fundamentals of Expression)	1	Pub Spk 2 (Fundamentals of Expression)	1
Rel 3 (Existence of God)	1	Rel 4 (Creation)	1
Mil Sci 3 (Basic Course)	1½	Mil Sci 4 (Basic Course)	1½
	16½		15½

Junior

	Units		Units
Phil 109 (Theory of Knowledge)	3	Phil 110 (Metaphysics)	3
Biol 101 (Vertebrate Anatomy)	4	Biol 102 (Vertebrate Embryology)	4
Chem 34A (Organic Chemistry)	4	Chem 34B (Organic Chemistry)	4
Phy 1-2 (Mechanics, Sound)	4	Phy 3-4 (Light, Heat, Electricity)	4
Rel 101 (God The Redeemer)	1	Rel 102 (God and Redemption)	1
	16		16

Senior

	Units		Units
Phil 151 (Fundamental Ethics)	3	Phil 152 (Applied Ethics)	3
Biol 107 (General Histology)	4	Biol 109 (Histological Technique)	2
Biol 104 (History of Biology)	2	Biol 110 (Heredity)	2
**Chem 115 (Food Analysis)	2	**Chem 132 (Heterocyclic Chemistry)	2
Rel 103 (The Sacraments)	1	Rel 104 (The Sacraments)	1
Engl. 46A (Literature)	3	Engl. 46B (Literature)	3
Elective (Economics or Political Science)	3	Elective (Economics or Political Science)	3
	18		16

* Foreign Language should be elected in French or German.
** Electives in Chemistry are offered each semester.

A CURRICULUM FOR CHEMISTRY MAJORS

Freshman

Fall Semester	Units	Spring Semester	Units
Engl 1A (English Composition)	3	Engl 1B (English Composition)	3
Psychology 1 (General Psychology)	3	Phil 9 (Logic)	3
*Language (German)	3	Language (German)	3
Chem 1A (Inorganic Chemistry)	5	Chem 1B (Inorganic Chemistry)	5
Math 1 (Algebra)	3	Math 2 (Trigonometry)	3
Rel 1 (Apologetics)	1	Rel 2 (The Church)	1
Mil Sci 1 (Basic Course)	1½	Mil Sci 2 (Basic Course)	1½
	19½		19½

* If German has been studied in high school, French is recommended.

Sophomore

	Units		Units
Phil 21 (Philosophy of Nature)	3	Phil 22 (Philosophy of Mind)	3
Math 41 (Analytic Geometry)	4	Math 42 (Calculus)	3
Chem 10A (Quantitative Analysis)	4	Chem 10B (Quantitative Analysis)	4
Language (German)	3	Language (German)	3
Pub Spk 1 (Fundamentals of Expression)	1	Pub Spk 2 (Fundamentals of Expression)	1
Rel 3 (Existence of God)	1	Rel 4 (Creation)	1
Mil Sci 3 (Basic Course)	1½	Mil Sci 4 (Basic Course)	1½
	17½		16½

Junior

	Units		Units
Phil 109 (Theory of Knowledge)	3	Phil 110 (Metaphysics)	3
Phy 1-2 (Mechanics, Sound)	4	Phy 3-4 (Light, Heat, Electricity)	4
Chem 30A (Organic Chemistry)	5	Chem 30B (Organic Chemistry)	5
**Chem 101 (Adv. Inorganic Chem.)	2	**Chem 102 (Adv. Inorganic Chem.)	2
Math 43 (Calculus)	3	Math 44 (Calculus)	3
Rel 101 (God The Redeemer)	1	Rel 102 (God and Redemption)	1
	18		18

Senior

	Units		Units
Phil 151 (Fundamental Ethics)	3	Phil 152 (Applied Ethics)	3
Chem 150A (Physical Chemistry)	3	Chem 150B (Physical Chemistry)	3
**Chem (Elective)		Chem 150C (Physical Chem. Lab)	2
Chem 180 (Methods of Research)	2	**Chem (Elective)	
Rel 103 (The Sacraments)	1	Chem 180 (Methods of Research)	2
Engl 46A (Literature)	3	Rel 104 (The Sacraments)	1
Elective (Political Science, Economics, or Chemistry)	3	Engl 46B (Literature)	3
		Elective (Political Science, Economics, or Chemistry)	3
	15+		17+

** Electives in Chemistry are offered each semester.

A CURRICULUM FOR ECONOMICS MAJORS

Fall Semester — Spring Semester

Freshman

	Units		Units
Engl 1A (English Composition)	3	Engl 1B (English Composition)	3
***Language (Foreign Language)	3	Language (Foreign Language)	3
Psychology 1 (General Psychology)	3	Phil 9 (Logic)	3
Rel 1 (Apologetics)	1	Rel 2 (The Church)	1
**Math 1 (Algebra)	3	**Math 2 (Trigonometry)	3
Science (Physics, Chemistry or Biology)	4	Science (Physics, Chemistry or Biology)	4
Mil Sci 1 (Basic Course)	1½	Mil Sci 2 (Basic Course)	1½
	18½		18½

Sophomore

	Units		Units
Engl 51 (Oratorical Composition)	3	Engl 52 (Poetry)	3
Language (Foreign Language)	3	Language (Foreign Language)	3
Phil 21 (Philosophy of Nature)	3	Phil 22 (Philosophy of Mind)	3
Rel 3 (Existence of God)	1	Rel 4 (Creation)	1
Pub Spk 1 (Fundamentals of Expression)	1	Pub Spk 2 (Fundamentals of Expression)	1
Econ 1A (Principles)	3	Econ 1B (Principles)	3
History 4A (European Survey)	3	History 4B (European Survey)	3
Mil Sci 3 (Basic Course)	1½	Mil Sci 4 (Basic Course)	1½
	18½		18½

** Recommended.

*** Foreign Language may be elected in Latin, Greek, German, French, Spanish or Italian.

Junior

	Units		Units
Phil 109 (Theory of Knowledge)	3	Phil 110 (Metaphysics)	3
Rel 101 (God The Redeemer)	1	Rel 102 (God and Redemption)	1
Econ 100 (Statistics)	4	Econ 110 (Economic History)	3
*Econ 120 (Finance and Taxation)	3	*Econ 122 (Money and Banking)	3
Hist 171A (United States)	3	Hist 171B (United States)	3
Engl 46A (Survey of Literature)	3	Engl 46B (Survey of Literature)	3
	17		16

Senior

	Units		Units
Phil 151 (Fundamental Ethics)	3	Phil 152 (Applied Ethics)	3
Rel 103 (The Sacraments)	1	Rel 104 (The Sacraments)	1
Econ 114 (Economic Theory)	3	Econ 116 (American Economic History)	3
*Econ 150 (Labor Problems)	3	*Econ 126 (Business Cycles)	3
Pol Sci 1 (Introduction)	3	Pol Sci 2 (Introduction)	3
*Elective	3	*Elective	3
	16		16

* Electives in Economics and Education are offered each semester.

A CURRICULUM FOR ENGLISH MAJORS

Fall Semester — Spring Semester

Freshman

	Units		Units
Engl 1A (Freshman Composition)	3	Engl 1B Freshman Composition)	3
*Language (Foreign Language)	3	Language (Foreign Language)	3
Psychology 1 (General Psychology)	3	Phil 9 (Logic)	3
Rel 1 (Apologetics)	1	Rel 2 (The Church)	1
Pub Spk 1 (Fundamentals of Expression)	1	Pub Spk 2 (Fundamentals of Expression)	1
Science (Physics, Chemistry or Biology)	4	Science (Physics, Chemistry or Biology)	4
Mil Sci 1 (Basic Course)	1½	Mil Sci 2 (Basic Course)	1½
	16½		16½

Sophomore

	Units		Units
Engl 51 (Oratorical Composition)	3	Engl 52 (Poetry and Versification)	3
Language (Foreign Language)	3	Language (Foreign Language)	3
Phil 21 (Philosophy of Nature)	3	Phil 22 (Philosophy of Mind)	3
Rel 3 (Existence of God)	1	Rel 4 (Creation)	1
**Pub Spk 3 (Philosophy of Expression)	1	**Pub Spk 4 (Philosophy of Expression)	1
Engl 46A (Survey of English Literature)	3	Engl. 46B (Survey of English Literature)	3
Hist 4A (Modern Europe)	3	Hist 4B (Modern Europe)	3
Mil Sci 3 (Basic Course)	1½	Mil Sci 4 (Basic Course)	1½
	18½		18½

Junior

	Units		Units
Phil 109 (Theory of Knowledge)	3	Phil 110 (Metaphysics)	3
Rel 101 (God The Redeemer)	1	Rel 102 (God and Redemption)	1
Engl 105 (Chaucer)	3	Engl 103 (Shakespeare)	3
Engl 113 (The English Renaissance)	3	Engl 114 (The Neo-Classical Period)	3
Hist 171A (United States)	3	Hist 171B (United States)	3
Econ 1A (Principles)	3	Econ 1B (Principles)	3
	16		16

* Foreign Language may be elected in Latin, Greek, German, French, Spanish or Italian.

** Elective.

Senior

	Units		Units
Phil 151 (Fundamental Ethics)	3	Phil 152 (Applied Ethics)	3
Rel 103 (The Sacraments)	1	Rel 104 (The Sacraments)	1
Engl 104 (Milton)	3	Engl 106 (Literary Criticism)	3
Engl 115 (The Age of Romanticism)	3	Engl 116 (The Victorian Age)	3
Pol Sci 1 (Introduction)	3	Pol Sci 2 (Introduction)	3
***Elective	3	***Elective	3
	16		16

*** Electives in English are offered each semester. English majors may elect a minor in History, or may elect courses in Foreign Language, Education or Advanced Military Science.

A CURRICULUM FOR HISTORY MAJORS

Fall Semester — Spring Semester

Freshman

	Units		Units
Engl 1A (English Composition)	3	Engl 1B (English Composition)	3
*Language (Foreign Language)	3	Language (Foreign Language)	3
Psychology 1 (General Psychology)	3	Phil 9 (Logic)	3
Rel 1 (Apologetics)	1	Rel 2 (The Church)	1
Pub Spk 1 (Fundamentals of Expression)	1	Pub Spk 2 (Fundamentals of Expression)	1
Science (Chemistry, Physics or Biology)	4	Science (Chemistry, Physics or Biology)	4
Mil Sci 1 (Basic Course)	1½	Mil Sci 2 (Basic Course)	1½
	16½		16½

Sophomore

	Units		Units
Engl 51 (Oratorical Composition)	3	Engl 52 (Poetry)	3
Language (Foreign Language)	3	Language (Foreign Language)	3
Phil 21 (Philosophy of Nature)	3	Phil 22 (Philosophy of Mind)	3
Rel 3 (Existence of God)	1	Rel 4 (Creation)	1
**Pub Spk 3 (Philosophy of Expression)	1	Pub Spk 4 (Philosophy of Expression)	1
Pol Sci 1 (Introduction)	3	Pol Sci 2 (Introduction)	3
Hist 4A (Modern Europe)	3	Hist 4B (Modern Europe)	3
Mil Sci 3 (Basic Course)	1½	Mil Sci 4 (Basic Course)	1½
	18½		18½

Junior

	Units		Units
Phil 109 (Theory of Knowledge)	3	Phil 110 (Metaphysics)	3
Rel 101 (God The Redeemer)	1	Rel 102 (God and Redemption)	1
***Hist 161A (The Americas)	3	Hist 161B (The Americas)	3
Hist 171A (United States)	3	Hist 171B (United States)	3
Econ 1A (Principles)	3	Econ 1B (Principles)	3
Engl 46A (Survey of English Literature)	3	Engl 46B (Survey of English Literature)	3
	16		16

* Foreign Language may be elected in Latin, Greek, German, French, Spanish or Italian.

** Elective

***Electives in History are offered each semester. History majors may elect a minor in Political Science, or English, or may elect courses in Education or Advanced Military Science according to their objectives.

Senior

	Units		Units
Phil 151 (Fundamental Ethics)	3	Phil 152 (Applied Ethics)	3
Rel 103 (The Sacraments)	1	Rel 104 (The Sacraments)	1
Hist 145 (Nineteenth Century)	3	Hist 146 (Twentieth Century)	3
***Hist 131A (The Renaissance and Reformation)	3	Hist 131B (Seventeenth and Eighteenth Centuries)	3
Elective	3	Elective	3
Elective	3	Elective	3
	16		16

*** Electives in History are offered each semester. History majors may elect a minor in Political Science, or English, or may elect courses in Education or Advanced Military Science according to their objectives.

A CURRICULUM FOR PHILOSOPHY MAJORS

Fall Semester **Spring Semester**

Freshman

	Units		Units
Engl 1A (English Composition)	3	Engl 1B (English Composition)	3
**Language (Foreign Language)	3	Language (Foreign Language)	3
Psychology 1 (General Psychology)	3	Phil 9 (Logic)	3
Rel 1 (Apologetics)	1	Rel 2 (The Church)	1
Pub Spk 1 (Fundamentals of Expression)	1	Pub Spk 2 (Fundamentals of Expression)	1
Science (Physics, Chemistry or Biology)	4	Science (Physics Chemistry or Biology)	4
Mil Sci 1 (Basic Course)	1½	Mil Sci 2 (Basic Course)	1½
	16½		16½

Sophomore

	Units		Units
Engl 51 (Oratorical Composition)	3	Engl 52 (Poetry)	3
Language (Foreign Language)	3	Language (Foreign Language)	3
Phil 21 (Philosophy of Nature)	3	Phil 22 (Philosophy of Mind)	3
Rel 3 (Existence of God)	1	Rel 4 (Creation)	1
*Pub Spk 3 (Philosophy of Expression)	1	Pub Spk 4 (Philosophy of Expression)	1
Phil 41A (History of Philosophy)	3	Phil 41B (History of Philosophy)	3
Hist 4A (Modern Europe)	3	Hist 4B (Modern Europe)	3
Mil Sci 3 (Basic Course)	1½	Mil Sci 4 (Basic Course)	1½
	18½		18½

Junior

	Units		Units
Phil 109 (Theory of Knowledge)	3	Phil 110 (Metaphysics)	3
Rel 101 (God The Redeemer)	1	Rel 102 (God and Redemption)	1
Phil 105 (Ancient Philosophy)	3	Phil 106 (Medieval Philosophy)	3
Hist 171A (United States)	3	Hist 171B (United States)	3
Engl 46A (Survey of English Literature)	3	Engl 46B (Survey of English Literature)	3
Econ 1A (Principles)	3	Econ 1B (Principles)	3
	16		16

Senior

	Units		Units
Phil 151 (Fundamental Ethics)	3	Phil 152 (Applied Ethics)	3
Rel 103 (The Sacraments)	1	Rel 104 (The Sacraments)	1
Phil 107 (Modern Philosophy)	3	Phil 108 (Recent Philosophy)	3
Pol Sci 1 (Introduction)	3	Pol Sci 2 (Introduction)	3
***Elective	3	Elective	3
Elective	3	Elective	3
	16		16

* Elective.
** Language may be elected in Latin, Greek, German, French, Spanish, or Italian.
*** Electives are offered in Education, Foreign Language, Military Science and in other major fields. Philosophy majors see page 114.

A CURRICULUM FOR POLITICAL SCIENCE MAJORS

Freshman

Fall Semester	Units	Spring Semester	Units
Engl 1A (English Composition)	3	Engl 1B (English Composition)	3
*Language (Foreign Language)	3	Language (Foreign Language)	3
Psychology 1 (General Psychology)	3	Phil 9 (Logic)	3
Rel 1 (Apologetics)	1	Rel 2 (The Church)	1
Science (Physics, Chemistry or Biology)	4	Science (Physics, Chemistry or Biology)	4
Pub Spk 1 (Fundamentals of Expression)	1	Pub Spk 1 (Fundamentals of Expression)	1
Mil Sci 1 (Basic Course)	1½	Mil Sci 2 (Basic Course)	1½
	16½		16½

Sophomore

	Units		Units
Engl 51 (Oratorical Composition)	3	Engl 52 (Poetry)	3
Language (Foreign Language)	3	Language (Foreign Language)	3
Phil 21 (Philosophy of Nature)	3	Phil 22 (Philosophy of Mind)	3
Rel 3 (Existence of God)	1	Rel 4 (Creation)	1
**Pub Spk 3 (Philosophy of Expression)	1	Pub Spk 4 (Philosophy of Expression)	1
Pol Sci 1 (Introduction)	3	Pol Sci 2 (Introduction)	3
History 4A (Modern Europe)	3	History 4B (Modern Europe)	3
Mil Sci 3 (Basic Course)	1½	Mil Sci 4 (Basic Course)	1½
	18½		18½

Junior

	Units		Units
Phil 109 (Theory of Knowledge)	3	Phil 110 (Metaphysics)	3
Rel 101 (God The Redeemer)	1	Rel 102 (God and Redemption)	1
Pol Sci 118A (History of Political Doctrines)	3	Pol Sci 118B (History of Political Doctrines)	3
***Pol Sci 157 (Constitutional Law)	3	***Pol Sci 158 (Government Control of Industry and Labor)	3
Econ 1A (Principles)	3	Econ 1B (Principles)	3
Engl 46A (Survey of English Literature)	3	Engl 46B (Survey of English Literature)	3
	16		16

Senior

	Units		Units
Phil 151 (Fundamental Ethics)	3	Phil 152 (Applied Ethics)	3
Rel 103 (The Sacraments)	1	Rel 104 (The Sacraments)	1
Pol Sci 123 (International Politics)	3	Pol Sci 133 (International Law)	3
Pol Sci 181 (Principles of Public Administration)	3	Pol Sci 172 (State and Local Government)	3
Hist 171A (United States)	3	Hist 171B (United States)	3
Elective	3	Elective	3
	16		16

* Foreign Language may be elected in Latin, Greek, German, French, Spanish or Italian.
** Elective.
***Additional electives will be offered.

COLLEGE OF BUSINESS ADMINISTRATION

GENERAL STATEMENT

The College of Business Administration aims to train students to meet the general as well as the specific problems of modern industry.

The College offers work in five fields of major emphasis, **Accounting, Industrial Management, Sales** and **Marketing, Finance,** and **Economics.** Additional work is offered in advertising, labor relations, statistics, transportation, business law retailing, personnel management, mathematics and other subjects.

During the first two years of the course extreme specialization is not the aim of the college. Rather, the student is trained well in the fundamentals of Economics, English, Accounting, Mathematics, and Philosophy, so that upon selection of his major field of emphasis in his Junior year, he will be well prepared and qualified to analyze and study the technical and specialized problems of business.

The courses in ethics, philosophy and science provide the student with the broader fundamental principles necessary for dealing with the industrial system in its social relationships.

During the Junior and Senior years, regardless of the field of major emphasis the student selects, he is required to take a sufficient variety of courses to develop an understanding and appreciation of the fields of: Industrial Management, Finance, Marketing, Business Law, Statistics, and Economics.

ENTRANCE REQUIREMENTS

To qualify for Freshman standing in the College of Business Administration, applicants must be graduates of an accredited high school and must present no less than sixteen units including the following:

English	3 units
Foreign Language (One Language)	2 units
Mathematics (Algebra and Geometry)	2 units
History	1 unit
Laboratory Science	1 unit
Optional, advanced course in Foreign Language, Mathematics, or Laboratory Science	1 unit

The remaining six units should be in solid college preparatory subjects rather than in the terminal and industrial courses. Additional courses in Foreign Language, Mathematics, Science, English and Social Studies are recommended.

The **quality** of the grades presented for entrance to the College of Business Administration must be above average. In view of the fact that a C average is required to remain in the College or to receive a degree, it is obvious that something better than a C average should be presented for entrance. Grades of D cannot be accepted in fulfillment of the requirements for entrance to College.

ORGANIZATION OF THE COLLEGE

The curriculum of the College of Business Administration extends over four years and leads to the degree of Bachelor of Science in Commerce.

The work in this college is divided into that of Lower Division and Upper Division.

LOWER DIVISION

The first two years (freshman and sophomore) of college work are known as the lower division. The work of the lower division supplements that of the secondary schools in establishing a basis for a liberal education, and at the same time includes work introductory to the professional courses required at the University.

Certain courses taken in the high school are better adapted to prepare the student to undertake these lower division requirements. It is desirable that the student should so arrange his high school program as to complete required work in the field of foreign language, and that he should do sufficient work in mathematics and the natural sciences to enable him to undertake with success the courses required in College. In no case, however, does the satisfaction of lower division requirements in the high school reduce the amount of work required in the lower division or for the degree. The lower division work presupposes the prescribed entrance requirements, the successful completion of Subject "A" and the specified requirements in the respective courses.

Required Lower Division Courses

It should be noted that the recommended program for the first two years is the same for all students.

Freshman Year

6 units of Mathematics
8 units of a Laboratory Science (Physics, Chemistry or Biology)
6 units of English
2 units of Introduction to Business
3 units of Military Science
3 units of General Physchology
3 units of Logic

Sophomore Year

6 units of Principles of Economics
8 units of Principles of Accounting
3 units of Mathematics
5 units of English
3 units of Military Science
3 units of Philosophy of the Mind
3 units of Philosophy of Nature

UPPER DIVISION

Courses offered in the upper division are designed to permit specialization in one of the following fields of major emphasis: ACCOUNTING, INDUSTRIAL MANAGEMENT, SALES AND MARKETING and FINANCE. Each student is required to select one of these majors on entering the upper division and must fulfill the following requirements:

1. At least 60 units of upper division subjects must be completed after fulfilling the requirements of the lower division. Where lower division units are taken for upper division credit, both the quantity and quality of such work must conform to upper division standards.
2. Residence of at least one year immediately preceding graduation is required for the granting of any degree.
3. Electives. Courses not taken as prescribed courses and not included in the students' major and minor sequences may be chosen as free electives to complete the 128 units required for graduation.

REQUIRED UPPER DIVISION COURSES

During the Junior and Senior years, regardless of the field of major emphasis the student selects, he is required to take a sufficient variety of courses to develop an understanding and appreciation of the fields of INDUSTRIAL MANAGEMENT, FINANCE, MARKETING, BUSINESS LAW, STATISTICS, AND ECONOMICS. All students are required to take the following courses:

Junior Year

4 units of Business Law
4 units of Statistics
3 units of Marketing
3 units of Money and Banking
6 units of the Theory of Knowledge and Reality
12 units of elective business subjects in field of major emphasis

Senior Year

6 units of Business Law
3 units of Industrial Organization and Management
3 units of Corporation Finance
1 unit of Job Analysis
3 units of Fundamental Ethics
3 units of Applied Ethics
12 units of elective business subjects in field of major emphasis

The above required courses give the students the training that is necessary in preparing them to have a broad business outlook. With courses in Marketing, Industrial Management, Corporation Finance, Economics, and Accounting, in their required program, the students are prepared to grasp and cope with the complicated problems of management. They are not limited in their analyses of these varied problems to any one phase of the operations of a company, but are equipped to consider all aspects.

GRADUATION

Graduation from this college requires the completion of 128 semester units of college work, of which 64 units constitute the amount required in the lower division and at least 60 of which are required in the upper division. To qualify for a degree a student must maintain at least a "C" average in the required Upper Division courses in Law and Economics. Of the total work taken during the four years, a minimum of 54 units must be completed in economics and business subjects.

Graduation Honors. A candidate for an undergraduate or professional degree who has a grade point average of 2.40 graduates **Cum Laude;** one who has a grade point average of 2.65, **Magna Cum Laude;** and one who has a grade point average of 2.85, **Maxima Cum Laude.** Graduation honors are based on the work of the four years.

The University reserves the right to exclude from graduation honors students who have been subject to disciplinary probation, or who, in the judgment of the Committee on Honors, are lacking in acceptable qualities of character or good citizenship. The work of transfer students will be interpreted in terms of the grades of this University.

PLANNED CURRICULA

Following are examples of planned curricula for the various subjects in which an opportunity for major study is offered in the College of Business Administration.

Freshman Year

Fall Semester	Units	Spring Semester	Units
Engl. 1A (English Composition)	3	Engl. 1B (English Composition)	3
Psych. 1 (General Psychology)	3	Phil. 9 (Logic)	3
Science (Chemistry, Physics or Biology)	4	Science (Chemistry, Physics or Biology)	4
Math. 1 (College Algebra)	3	Math. 16 (Trigonometry)	3
Econ. 11 (Intro. to Business)	2	Econ. 8 (Economic Geography)	2
Religion 1 (Apologetics)	1	Religion 2 (The Church)	1
Military Science 1	1½	Military Science 2	1½
	17½		17½

Sophomore Year

Phil 21 (Philosophy of Nature)	3	Phil. 22 (Philosophy of Mind)	3
Engl. 51 (Oratorical Composition)	3	Econ. 16 (Mathematics of Finance)	3
Econ. 1A (Prin. of Econ.)	3	Econ. 1B (Prin. of Econ.)	3
Econ. 10A (Accounting)	4	Econ. 10B (Accounting)	4
Public Speaking 1	1	Public Speaking 2	1
Religion 3 (Existence of God)	1	Religion 4 (Creation)	1
Military Science 3	1½	Military Science 4	1½
	16½		16½

SUGGESTED PROGRAM FOR A MAJOR IN ACCOUNTING

Accounting: For those who wish to follow the accounting profession either with public accounting firms or in private industry. Upon the completion of this major, the graduate is prepared to take the examination for Certified Public Accountant.

Junior Year

Fall Semester	Units	Spring Semester	Units
Econ. 130 (Accounting Valuation)	3	Econ. 131 (Accounting; Proprietorship)	3
Econ. 133 (Cost Accounting)	3	Econ. 135 (Analysis of Financial Statements	3
Econ. 181 (Prin. of Marketing)	3	Econ. 100 (Principles of Statistics)	4
Econ. 122 (Money and Banking)	3	Philosophy 110 (Metaphysics)	3
Law 1 (Contracts)	2	Law 2 (Agency and Sales)	2
Phil. 109 (Theory of Knowledge and Reality)	3	Religion 102 (God and Redemption)	1
Religion 101 (God the Redeemer)	1		
	18		16

Senior Year

Econ. 132 (Advanced Accounting)	3	Econ. 132 (Accounting Problems)	5
Econ. 138 (Income Taxation)	3	Econ. 137 (Auditing)	3
Econ. 160 (Industrial Organization and Management	3	Law 4 (Partnerships and Corporations, Bankruptcy)	3
Law 3 (Negotiable Instruments, Bailments and Carriers, Property)	3	Phil. 152 (Applied Ethics)	3
Phil. 151 (Fundamental Ethics)	3	Religion 104 (The Sacraments)	1
Riligion 103 (The Sacraments)	1		
	16		15

SUGGESTED PROGRAM FOR A MAJOR IN FINANCE

Finance: This major is for those students who are planning to enter banking, insurance, investment, or brokerage professions.

Junior Year

Fall Semester	Units	Spring Semester	Units
Econ. 122 (Money and Banking)	3	Econ. 100 (Principles of Statistics)	4
Econ. 130 (Accounting Valuation)	3	Econ. 131 (Accounting; Proprietorship)	3
Econ. 181 (Principles of Marketing)	3	Econ. 135 (Analysis of Financial Statements)	3
Law 1 (Contracts)	2	Law 2 (Agency and Sales)	2
Phil. 109 (Theory of Knowledge and Reality)	3	Phil. 110 (Metaphysics)	3
Religion 101 (God the Redeemer)	1	Religion 102 (God and Redemption)	1
	15		16

Senior Year

Econ. 121 (Corporation Finance)	3	Econ. 127 (Problems in Corporation Finance)	3
Econ. 124 (Investments and Investment Institutions)	3	Econ. 120 (Public Finance and Taxation)	3
Econ. 138 (Income Taxation)	3	Econ. 160 (Industrial Organization and Management)	3
Phil. 151 (Fundamental Ethics)	3	Law 4 (Partnerships and Corporations, Bankruptcy)	3
Religion 103 (The Sacraments)	1	Phil. 152 (Applied Ethics)	3
Law 3 (Negotiable Instruments, Bailments and Carriers, Property)	3	Religion 104 (The Sacraments)	1
	16		16

SUGGESTED PROGRAM FOR A MAJOR IN INDUSTRIAL MANAGEMENT

Industrial Management: This major is designed for those students who desire to follow courses in production, purchasing or personnel management.

Junior Year

Fall Semester	Units	Spring Semester	Units
Econ. 133 (Cost Accounting)	3	Econ. 136 (Industrial Cost Analysis and Budgeting)	3
Econ. 160 (Industrial Organization and Management)	3	Econ. 100 (Principles of Statistics)	4
Econ. 181 (Principles of Marketing)	3	Econ. 183 (Transportation)	3
Econ. 122 (Money and Banking)	3	Law 2 (Agency and Sales)	2
Law 1 (Contracts)	2	Phil. 110 (Metaphysics)	3
Phil. 109 (Theory of Knowledge and Reality)	3	Religion 102 (God and Redemption)	1
Religion 101 (God the Redeemer)	1		16
	18		

Senior Year

Econ. 150 (Labor Problems)	3	Econ. 135 (Analysis of Financial Statements)	3
Econ. 121 (Corporation Finance)	3	Econ. 166 (Personnel Management)	3
M.E. 137 (Time Study and Job Analysis)	2	M.E. 138 (Production Control)	3
Law 3 (Negotiable Instruments) Bailments and Carriers, Property)	3	Law 4 (Partnerships and Corporations, Bankruptcy)	3
Phil. 151 (Fundamental Ethics)	3	Religion 104 (The Sacraments)	1
Religion 103 (The Sacraments)	1	Phil. 152 (Applied Ethics)	3
	15		16

SUGGESTED PROGRAM FOR A MAJOR IN SALES AND MARKETING

Sales and Marketing: This major is designed for students who desire to prepare for a career in marketing, merchandising, advertising, selling, market research work, or some phase of distribution.

Junior Year

Fall Semester	Units	Spring Semester	Units
Econ. 181 (Principles of Marketing)	3	Econ. 183 (Transportation)	3
Econ. 100 (Principles of Statistics)	4	Econ. 180 (International Trade)	3
Econ. 122 (Money and Banking)	3	Econ. 185 (Salesmanagement)	3
Law 1 (Contracts)	2	Law 2 (Agency and Sales)	2
Phil. 109 (Theory of Knowledge and Reality)	3	Phil. 110 (Metaphysics)	3
Religion 101 (God the Redeemer)	1	Religion 102 (God and Redemption)	1
	16		15

Senior Year

Econ. 160 (Industrial Organization and Management)	3	Econ. 165 (Retailing)	3
Econ. 184 (Advertising)	3	Econ. 166 (Personnel Management)	3
Econ. 121 (Corporation Finance)	3	Econ. (Elective)	3
Law 3 (Negotiable Instruments Bailments and Carriers, Property)	3	Law 4 (Partnerships and Corporations, Bankruptcy)	3
Phil. 151 (Fundamental Ethics)	3	Phil. 152 (Applied Ethics)	3
Religion 103 (The Sacraments)	1	Religion 104 (The Sacraments)	1
	16		16

Students who do not desire to specialize in the above listed majors, may with the permission of the Dean arrange a program which will include selected courses from the various fields of Economics. However, this program must include the following in the Junior and Senior years:

Philosophy	12 units
Religion	4 units
Commercial Law	10 units
Statistics	4 units
Economics	24 units
Electives	6 to 10 units
Total	60 to 64 units

Business Lectures

Throughout the year a series of lectures is given by business and public men of prominence on various problems of interest to the student body. These lectures bring the students into personal contact with representative business men and also enable them to become familiar with practical business problems.

Inspection Trips

The close connection of the University with the business and industrial establishments of the San Francisco metropolitan district enables the faculty to arrange various inspection trips to such industries as may be of interest. In this way students are given a practical insight into the business organization and working of representative industries.

Organizations

Among the business societies for students on campus are a BUSINESS ADMINISTRATION ASSOCIATION, a student branch of THE AMERICAN MARKETING ASSOCIATION, and at present a chapter of the professional commerce fraternity DELTA SIGMA PI is being formed. The College of Business Administration is also one of the cooperating organizations which puts on the Boston Conference on Distribution each year.

EVENING DIVISION

The College of Business Administration's Evening Division offers courses in the fields of Accountancy, Business Law, Sales and Industrial Management.

Subsequent demand for specialized work will be the criterion for continuation and elaboration of the program.

High School graduates presenting the necessary units for admission to the University of Santa Clara will be granted college credits for the work taken, upon successful completion of their Evening Division courses.

Students who do not meet the entrance requirements will be admitted on special examination or on their record of experience. Special students will not receive college credit for work taken.

COLLEGE OF ENGINEERING

COLLEGE OF ENGINEERING—ADVISORY BOARD

Donald I. Cone

Warren H. McBryde

Glenn B. Woodruff

INTRODUCTION

COLLEGE OF ENGINEERING

The College of Engineering in the University of Santa Clara was founded to give young men, ambitious to follow the profession of engineering, an opportunity to prepare for their profession in an environment and atmosphere conducive to deep, persevering study and to cultural and moral development.

To meet this demand, the Faculty of the University added sound and thorough courses in Civil, Electrical and Mechanical Engineering. As in all other departments of the University, the students are under the moral guidance of the Jesuit Fathers. The technical work of these departments is in the hands of experienced and practical engineers who devote their whole time and attention to the success of their work. As is traditional at Santa Clara, students in Engineering are given individual care, assistance, advice and encouragement. The work exacted is of the highest type; nevertheless, owing to this individual care and to the judicious admission of students as well as to the prompt elimination from the various departments of students found to be inadequately prepared in fundamental studies or in seriousness of purpose, there is very little likelihood and no excuse for failure on the part of the student.

The engineer today must be more than a machinist, electrician or surveyor. He can no longer be a self-made man in the old sense. He must possess the acumen and culture which only a broad college training and college association can give, and his acquaintance with and love of mathematics and science should be the foundation on which his knowledge of their technical application is based.

This is the ideal which Santa Clara cherishes for the engineers who shall receive their education from her, and the notable work which her graduates are doing proves that this ideal leads to success.

ENTRANCE REQUIREMENTS

The following are the required high school units necessary for admission to Freshman standing in the College of Engineering. A total of fifteen units, including the following, is necessary.

English	3	Trigonometry	½
Foreign Language	2	History	1
Algebra	2	Chemistry	1
Geometry	1	Physics	1

It is strongly recommended that the unprescribed units be in Mathematics, Languages or Sciences.

COURSES — DEGREES

Courses are offered leading to the degrees of Bachelor of Civil Engineering, Bachelor of Electrical Engineering and Bachelor of Mechanical Engineering. These courses aim, first, to give the student a thorough knowledge of the sciences on which all Engineering is based; second, to develop practical judgment so that he may be able to use his knowledge and information to best advantage.

The curricula in the College of Engineering are arranged according to two plans, respectively called the Four Year Plan and the Five Year Plan. Technical course content and requirements for graduation are the same in both plans. The required work prepares the student for accepting and discharging the responsibilities of his chosen profession. The Five Year Plan; (1) distributes the required work over a longer period, and (2) permits election of added cultural and technical courses for which no time is allowed in the Four Year Plan. A Five Year Plan student, free from deficiencies in University work, may register for 18 units of new work. Upon approval by the Dean of the College of Engineering, change can be made at any time from the Four Year Plan to the Five Year Plan. The change from the Five Year Plan to the Four Year Plan cannot be effected without transfer of sufficient credits to meet the schedule in the latter plan.

Civil Engineering relates to works in connection with transportation, such as highways, railways and canals; to structural works, such as bridges, buildings, dams, piers and many other structures constructed in wood, steel or reinforced concrete; to sanitary works and works which have to do with water, such as the collection, purification and distribution of water for a municipal supply; the collection, treatment and disposal of sewage; the drainage of some lands and the irrigation of others. In all of these fields of work, technical knowledge is required for the execution of successful designs, and for their proper operation and maintenance.

All Civil Engineering students are required to attend a four-weeks summer session in surveying immediately following the close of their sophomore year. This work fulfills the requirements of one of the summers that must be spent on engineering work. Students are required to present 135 units for graduation in addition to the Summer Surveying course.

Electrical Engineering is a profession of widespread application. In spite of this diversity the basic principles apply equally to the generation, transmission and utilization of electrical energy for heating, mechanical power, illumination, wire and radio communication, electronic control, measurements, navigational aids, etc. At Santa Clara the underlying preparation in mathematics, physics, chemistry, mechanics, thermodynamics, and drawing is given in the first three-fourths of the scheduled program. This preparation is common to Mechanical and Electrical Engineering so the courses are largely the same. In the remaining fourth of the program the fundamental principles are applied to vacuum tube circuits, transmission lines, rotating machinery, etc., to formulate working rules, explain operating behavior and establish and apply economic and technical design criteria. The aim is always to develop the student's ability to apply the fundamental principles. In the final semester the application studies are continued in power or communications according to the option chosen.

Mechanical Engineering may be divided into three closely related lines, Design, Management and Power Generation. The courses in Design begin with mechanical drawing and continue with a study of mechanisms, strength of materials, stresses, vibration, adaptability, ease of manufac-

ture, cost, and commercial worth of machines. Management has to do with the organization of commercial enterprise, systems of works management, efficiency systems, engineering economics, cost of materials and power, and layout of machinery in a factory for maximum output. The subject of Power Generation is covered by courses on steam and internal combustion engines, turbines, boilers, water motors and electrical generators, together with the proper operation of all classes of machinery and the application of power to them.

GRADUATE DEGREES

For the degrees of Civil Engineer (C.E.), Electrical Engineer (E.E.), and Mechanical Engineer (M.E.), it is required that the candidate be a graduate of the College of Engineering of this University who has been engaged in acceptable professional work for a period of not less than three years after receiving the Bachelor's degree. Candidates for these degrees must declare their candidacy and file with the Dean of the College of Engineering a detailed statement covering their professional study and experience and an outline of their proposed thesis not later than December 31st preceding the commencement at which they wish to receive the degree, and they must submit the completed thesis not later than one month prior to the date fixed for the annual conferring of degrees.

INSPECTION TRIPS

One important advantage of the University is its proximity to the many industrial establishments of the San Francisco metropolitan district and this opportunity is taken advantage of by inspection trips to special industries. In this way students are given a practical insight into the operation of these engineering industries.

STUDENT BRANCHES:
AMERICAN SOCIETY OF CIVIL ENGINEERS
AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS
AMERICAN SOCIETY OF MECHANICAL ENGINEERS

Student Branches of the A.S.C.E., A.I.E.E. and A.S.M.E. have been established at the University, and are open to students of Civil, Electrical and Mechanical Engineering for the discussion of current problems.

REQUIREMENTS FOR GRADUATION

In all curricula of the College of Engineering, 135 credits are required for graduation. A credit is given for each one-hour recitation or lecture per week, carried satisfactorily for one semester or for three hours per week spent in laboratory, drawing room or shop. All regular students free from deficiencies in university work may register for 18 units of new work.

At least two summer vacations must be spent on engineering work before graduation. A detailed report of this work must be handed to the Dean of the College of Engineering within one month of the opening of the first semester of the Senior year.

Before anyone is admitted to the final examinations of the second semester of the Senior year, he must submit a thesis on a subject chosen by the student, with the approval of the Dean of the College of Engineering. It must deal with an engineering subject and must give evidence of original investigation of some engineering problem. It must consist of no fewer than 5,000 words and should be typewritten on paper 8½ x 11 inches. The ultimate decision as to whether the thesis is of sufficient merit to fulfill the requirements rests with the Committee on Theses.

Residence of at least one year immediately preceding graduation is required for the granting of any degree.

GRADUATION HONORS

A candidate for undergraduate or professional degree who has a grade point average of 2.40 graduates **Cum Laude**; one who has a grade point average of 2.65, **Magna Cum Laude**; and one who has a grade point average of 2.85, **Maxima Cum Laude.**

Graduation honors are based on the work of the four years.

The University reserves the right to exclude from graduation honors students who have been subject to disciplinary probation, or who, in the judgment of the Committee of Honors, are lacking in acceptable qualities of good citizenship. The work of transfer students will be interpreted in terms of the grades of this University.

CIVIL ENGINEERING

FOUR YEAR PLAN

*Freshman Year

Fall Semester	R	L	U
Math. 41 (Analytic Geom.)	5		4
Chem. 3A (General Chem.)	2	6	4
Engl. 1A (Composition)	3		3
G. E. 1 (Engineering Drawing)		6	2
G. E. 7 (Orientation)	2		1
M. E. 11 (Shop)		3	1
Mil. Sci. 1	1	2	1½
Religion 1	2		½
	15	17	17

Spring Semester	R	L	U
Math. 42 (Diff. Calc.)	3		3
Chem. 3B (General Chem.)	2	6	4
Eng. 1B (Composition)	3		3
Physics 11 (Mechanics of Solids, Liquids and Gases)	2		2
G. E. 2 (Engineering Drawing)		6	2
Mil. Sci. 2	1	2	1½
Religion 2	2		½
	13	14	16

**Sophomore Year

Math. 33 (Calculus)	5		4
Physics 12	3		3
Physics 13		6	2
G. E. 15 (Mechanics-Statics)	3		3
C. E. 7 (Surveying)	1		1
C. E. 57 (Survey Practice)		6	2
Mil. Sci. 3	1	2	1½
Religion 3	2		½
	15	14	17

Math. 34 (Calculus)	5		4
Physics 14	3		3
Physics 15		6	2
G. E. 16 (Mechanics-Materials)	4		4
G. E. 66 (Materials Lab.)		3	1
C. E. 58 (Survey Practice)		3	1
Mil. Sci. 4	1	2	1½
Religion 4	2		½
	15	14	17

C. E. 8 Summer School of Surveying following the Sophomore Year ..... 4 Units

**Junior Year

G. E. 115 (Mechanics-Dynamics)	2		2
G. E. 165 (Dynamics Lab.)		3	1
G. E. 117 (Materials, Processes)	2		2
E. E. 135 (Electrical Engr.)	3		3
E. E. 185 (Elect. Lab.)		3	1
Geol. 101 (Engr. Geology)	2	3	3
Math. 116 (Diff. Equations)	2		2
C. E. 171A (Graphic Problems)		3	1
Philosophy 61	3		1½
Religion 101	2		½
	16	12	17

G. E. 116 (Mechanics-Fluids)	2		2
G. E. 166 (Fluids Lab.)		3	1
Engl. 14 (Tech. English)	2		2
M. E. 130 (Heat Power)	3		3
M. E. 180 (M. E. Lab.)		3	1
C. E. 122 (Structures)	4		4
C. E. 172 (Structural Design)		6	2
Philosophy 62	3		1½
Religion 102	2		½
	16	12	17

* This curriculum applies to students who matriculate Fall Semester, 1950.

** This curriculum applies to students who matriculated before Fall, 1950.

**Senior Year

	R	L	U		R	L	U
C. E. 131 (Sanitary Engr.	3		3	C. E. 142 (Transportation)	2		2
C. E. 181 (Sanitary Lab.)		3	1	C. E. 192 (Transportation Lab.)		3	1
C. E. 123 (Structures)	2		2	C. E. 124 (Reinforced Concrete)	4		4
C. E. 173 (Structural Design)		6	2	C. E. 174 (Structural Design)		3	1
C. E. 169A (Thesis)		3	1	G. E. 126 (Engineering Review)		3	1
G. E. 121 (Engr. Econ.)	3		3	G. E. 108 (Seminar)	1		1
Public Speaking 1	1		1	C. E. 170 (Thesis)		3	1
Philosophy 63	3		1½	Philosophy 64	3		1½
Religion 103	2		½	Religion 104	2		½
Options	2	3	3	Options	2	3	3
	16	15	18		14	15	16

OPTIONS IN CIVIL ENGINEERING

TRANSPORTATION

Fall Semester				Spring Semester			
C. E. 109 (Route Surveying)	2		2	C. E. 144 (Transportation Engr.)	2		2
C. E. 159 (Survey Practice)		3	1	C. E. 194 (Transportation Lab.)		3	1
	2	3	3		2	3	3
STRUCTURAL							
C. E. 125 (Structures)	2		2	C. E. 126 (Soil Mechanics)	2		2
C. E. 175 (Structural Design)		3	1	C. E. 176 (Soils Lab.)		3	1
	2	3	3		2	3	3
SANITARY							
C. E. 133 (Sanitary Engr.)	2		2	C. E. 134 (Sanitary Engr.)	2		2
C. E. 183 (Sanitary Design)		3	1	C. E. 184 (Sanitary Lab.)		3	1
	2	3	3		2	3	3

CIVIL ENGINEERING

FIVE YEAR PLAN

*Freshman Year

Fall Semester	R	L	U	Spring Semester	R	L	U
Math. 1 (Algebra)	3		3	Math. 2 (Trigonometry)	3		3
Chem. 3A (General Chem.)	2	6	4	Chem. 3B (General Chem.)	2	6	4
Engl. 1A (Composition)	3		3	Engl. 1B (Composition)	3		3
G. E. 1 (Engr. Drawing)		6	2	Physics 11 (Mechanics of Solids, Liquids and Gases)	2		2
G. E. 7 (Orientation)	2		1	G. E. 2 (Engr. Drawing)		6	2
M. E. 11 (Shop)		3	1	Mil. Sci. 2	1	2	1½
Mil. Sci. 1	1	2	1½	Religion 2	2		½
Religion 1	2		½				
	13	17	16		13	14	16

**Sophomore Year

Math. 33 (Calculus)	5		4	Math. 34 (Calculus)	5		4
Chem. 3A (General Chem.)	2	6	4	Chem. 3B (General Chem.)	2	6	4
C. E. 7 (Surveying)	1		1	C. E. 58 (Survey Practice)		3	1
C. E. 57 (Survey Practice)		6	2	Law 91	1		1
Mil. Sci. 3	1	2	1½	Mil. Sci. 4	1	2	1½
Religion 3	2		½	Religion 4	2		½
	11	14	13		11	11	12

C. E. 8 Summer School of Surveying following the Sophomore Year ..... 4 Units

**Junior Year

G. E. 15 (Mechanics-Statics)	3		3	G. E. 16 (Mechs. of Materials)	4		4
Physics 12	3		3	G. E. 66 (Materials Lab.)		3	1
Physics 13		6	2	Physics 14	3		3
G. E. 117 (Engr. Materials)	2		2	Physics 15		6	2
Geol. 101 (Engr. Geology)	2	3	3	Engl. 14 (Tech. English)	2		2
Philosophy 61	3		1½	Philosophy 62	3		1½
Religion 101	2		½	Religion 102	2		½
	15	9	15		14	9	14

* This curriculum applies to students who matriculate Fall Semester, 1950.
** This curriculum applies to students who matriculated before Fall, 1950.

**Sub-Senior Year

	R	L	U
G. E. 121 (Engineering Econ.)	3		3
G. E. 115 (Mechanics Dynamics)	2		2
G. E. 165 (Dynamics Lab.)		3	1
E. E. 135 (Elect. Engr.)	3		3
E. E. 185 (Elect. Lab.)		3	1
Math. 116 (Diff. Equations)	2		2
C. E. 171A (Graphic Problems)		3	1
Philosophy 63	3		1½
Religion 103	2		½
	15	9	15

	R	L	U
G. E. 116 (Mechanics-Fluids)	2		2
G. E. 166 (Fluids Lab.)		3	1
M. E. 130 (Heat Power)	3		3
M. E. 180 (M. E. Lab.)		3	1
C. E. 122 (Structures)	4		4
C. E. 172 (Structural Design)		6	2
Philosophy 64	3		1½
Religion 104	2		½
	14	12	15

**Senior Year

	R	L	U
C. E. 131 (Sanitary Engr.)	3		3
C. E. 181 (Sanitary Lab.)		3	1
C. E. 123 (Structures)	2		2
C. E. 173 (Structural Design)		6	2
C. E. 169A (Thesis)		3	1
Econ. 10A (Accounting)	3	3	4
Public Speaking 1	1		1
Options	2	3	3
	11	18	17

	R	L	U
C. E. 142 (Transportation)	2		2
C. E. 192 (Transportation Lab.)		3	1
C. E. 124 (Reinforced Concrete)	4		4
C. E. 174 (Structural Design)		3	1
C. E. 126 (Engineering Review)		3	1
G. E. 108 (Seminar)	1		1
C. E. 170 (Thesis)		3	1
Options	2	3	3
	9	15	14

Options the same as for four year plan.

ELECTRICAL AND MECHANICAL ENGINEERING

FOUR YEAR PLAN

*Freshman Year

Same as Civil Engineering except that one unit of shop is substituted for Surveying in the seoond semester.

**Sophomore Year

Fall Semester	R	L	U
Math. 33 (Calculus)	5		4
Physics 12	3		3
Physics 13		6	2
G. E. 15 (Mechanics-Statics)	3		3
M. E. 15 (M. E. Lab.)	1	3	2
Public Speaking 1	1		1
Mil. Sci. 3	1	2	1½
Religion 3	2		½
	16	11	17

Spring Semester	R	L	U
Math. 34 (Calculus)	5		4
Physics 14	3		3
Physics 15		6	2
G. E. 16 (Mechs.-Materials)	4		4
M. E. 16 (Machine Drawing)		3	1
G. E. 66 (Materials Lab.)		3	1
Mil. Sci. 4	1	2	1½
Religion 4	2		½
	15	14	17

ELECTRICAL ENGINEERING

**Junior Year

	R	L	U
G. E. 115 (Mechanics-Dynamics)	2		2
G. E. 165 (Mechanics Lab.)		3	1
G. E. 117 (Materials, Processes)	2		2
E. E. 125 (Elect. and Mag. Circuits)	3		3
E. E. 175 (Elect. Circuits Lab.)		3	1
M. E. 125 (Heat Power)	3		3
M. E. 175 (M. E. Lab.)		3	1
M. E. 191 (Mach. Design)	1	3	2
Philosophy 61	3		1½
Religion 101	2		½
	16	12	17

	R	L	U
G. E. 116 (Mechanics-Fluids)	2		2
G. E. 166 (Fluids Lab.)		3	1
Engl. 14 (Technical Engl.)	2		2
E. E. 126 (Elect. Machines)	3		3
E. E. 176 (Elect. Mach. Lab.)		3	1
M. E. 126 (Heat Power)	3		3
M. E. 176 (M. E. Lab.)		3	1
Phys. 104 (Elect. Measur.)	1	3	2
Philosophy 62	3		1½
Religion 102	2		½
	16	12	17

* This curriculum applies to students who matriculate Fall Semester, 1950.
** This curriculum applies to students who matriculated before Fall, 1950.

**Senior Year

	R	L	U
G. E. 121 (Engr. Economics)	3		3
Math. 116 (Diff. Equations)	2		2
E. E. 127 (Adv. Elect. Cir. Mach.)	3		3
E. E. 177 (Adv. Cir. and Mach. Lab.)		3	1
E. E. 131 (Basic Electronics)	3		3
E. E. 181 (Electronics Lab.)		3	1
E. E. 170 and/or E. E. 171 (Thesis and/or E. E. Design)		6	2
Philosophy 63	3		1½
Religion 103	2		½
	16	12	17

	R	L	U
G. E. 108 (Seminar)	1		1
G. E. 126 (Engineering Review)		3	1
E. E. 170 and/or 171 (Thesis and/or E. E. Design)		6	2
Philosophy 64	3		1½
Religion 104	2		½
Option			7
Technical Electives			4
***(See Note below)			
	6	9	17

***Work may be elected in Civil, Electrical or Mechanical Engineering or in any combination of these. Elective Electrical Engineering Courses are catalogued courses not required in the option which the student follows. Elective Civil or Mechanical Engineering courses must be upper division courses not already required in the above curriculum.

MECHANICAL ENGINEERING

**Junior Year

Fall Semester	R	L	U
G. E. 115 (Mechanics-Dynamics)	2		2
G. E. 165 (Dynamics Lab.)		3	1
G. E. 117 (Materials and Processes)	2		2
E. E. 125 (Elec. and Mag. Cir.)	3		3
E. E. 175 (Elect. Lab.)		3	1
M. E. 125 (Heat Power)	3		3
M. E. 175 (M. E. Lab.)		3	1
M. E. 191 (Mach. Design)	1	3	2
Philosophy 61	3		1½
Religion 101	2		½
	16	12	17

Spring Semester	R	L	U
G. E. 116 (Mechanics-Fluids)	2		2
G. E. 166 (Fluids Lab.)		3	1
Engl. 14 (Tech. English)	2		2
E. E. 126 (Elect. Mach.)	3		3
E. E. 176 (Elect. Lab.)		3	1
M. E. 126 (Heat Power)	3		3
M. E. 176 (M. E. Lab.)		3	1
M. E. 192 (Mach. Design)	1	3	2
Philosophy 62	3		1½
Religion 102	2		½
	16	12	17

See note under Industrial Engineering Option

**Senior Year

	R	L	U
G. E. 121 (Engr. Econ.)	3		3
Math. 116 (Diff. Equations)	2		2
M. E. 193 (Mach. Design)		6	2
M. E. 169 (Thesis)		3	1
Philosophy 63	3		1½
Religion 103	2		½
Options	5	9	8
	15	18	18

	R	L	U
G. E. 108 (Seminar)	1		1
G. E. 126 (Engineering Review)		3	1
M. E. 138 (Production Contl.)	3		3
M. E. 170 (Thesis)		3	1
Philosophy 64	3		1½
Religion 103	2		½
Options	6	9	9
	15	15	17

OPTIONS IN MECHANICAL ENGINEERING

AERONAUTICAL

	R	L	U
M. E. 135 (Inter. Comb. Engines)	3		3
M. E. 185 (Int. Comb. Eng. Lab.)		3	1
M. E. 133 (Aerodynamics)	2		2
M. E. 183 (Aerodynamics Lab.)		3	1
	5	6	7

	R	L	U
M. E. 136 (Inter. Comb. Engines)	2		2
M. E. 186 (Int. Com. Eng. Lab.)		3	1
M. E. 134 (Airplane Struct).	2		2
M. E. 184 (Airplane Lab.)		3	1
M. E. 146 (Metallurgy)	2		2
M. E. 196 (Metallurgy Lab.)		3	1
	6	9	9

** This curriculum applies to students who matriculated before Fall, 1950.

OPTIONS IN ELECTRICAL ENGINEERING

POWER OPTION	R	L	U
E. E. 128C (Adv. A-C Mach.)	4		4
E. E. 178 (Adv. A-C Mach. Lab.)		3	1
E. E. 172 (Power Gen. and Distribution Problems)	1	3	2
	5	6	7

COMMUNICATIONS OPTION	R	L	U
E. E. 132 (Adv. Electronics)	3		3
E. E. 136 (Communications Cir.)	3		3
E. E. 182 (Adv. Electronics Lab.)		3	1
	6	3	7

AIR CONDITIONING

	R	L	U
M. E. 127 (Heat Power)	2		2
M. E. 177 (M. E. Lab.)		3	1
M. E. 131 (Heating, Ventilation and Air Conditioning)	3		3
M. E. 181 (Heat and Vent. Lab.)		3	1
	5	6	7

	R	L	U
M. E. 128 (Heat Power)	2		2
M. E. 178 (M. E. Lab.)		3	1
M. E. 132 (Heating, Ventilation and Air Conditioning)	2		2
M. E. 182 (Heat and Vent. Lab.)		3	1
M. E. 146 (Metallurgy)	2		2
M. E. 196 (Metallurgy Lab.)		3	1
	6	9	9

HEAT POWER

	R	L	U
M. E. 127 (Heat Power)	2		2
M. E. 177 (M. E. Lab.)		3	1
M. E. 135 (Inter. Comb. Engines)	3		3
M. E. 185 (Int. Com. Eng. Lab.)		3	1
	5	6	7

	R	L	U
M. E. 136 (Inter. Comb. Eng.)	2		2
M. E. 186 (Int. Com. Eng. Lab.)		3	1
M. E. 128 (Heat Power)	2		2
M. E. 178 (Heat Power Lab.)		3	1
M. E. 146 (Metallurgy)	2		2
M. E. 196 (Metallurgy Lab.)		3	1
	6	9	9

INDUSTRIAL ENGINEERING

	R	L	U
Econ. 133 (Cost Accounting)	3		3
M. E. 137 (Time Study and Job Analysis)	2		2
M. E. 187 (Time Study Lab.)		6	2
	5	6	7

	R	L	U
Econ. 100 (Statistics)	3	3	4
Econ. 136 (Ind. Cost Analysis)	3		3
M. E. 188 (Production Lab.)		3	1
M. E. 132 (Heating, Ventilation and Air Conditioning)	2		2
M. E. 182 (Heat and Vent. Lab.)		3	1
	8	9	11

NOTE: Students who intend to choose the Industrial Engineering Option should make the following substitutions in the Junior Year of their course: (Econ. 10A, 10B; E. E. 135, 185; M. E. 130, 180) for (E. E. 125, 126, 175, 176; M. E. 125, 126, 175, 176).

FIVE YEAR PLAN

*Freshman Year

Same as Civil Engineering except that one unit of shop is added in the second semester.

**Sophomore Year

Fall Semester

Math. 33 (Calculus)	5		4
Chem. 3A (General Chem.)	2	6	4
Econ. 10A (Accounting)	3	3	4
Mil. Sci. 3	1	2	1½
Religion 3	2		½
	13	11	14

Spring Semester

Mil. Sci. 4	1	2	1½
Math. 34 (Calculus)	5		4
Chem. 3B (General Chem.)	2	6	4
Econ. 10B (Accounting)	3	3	4
Religion 4	2		½
	13	11	14

**Junior Year

G. E. 15 (Mech.-Statics)	3		3
G. E. 117 (Engr. Mater.)	2		2
Physics 12 (General Physics)	3		3
Physics 13 (Physics Lab.)		6	2
M. E. 15 (M. E. Lab.)	1	3	2
Public Speaking 1	1		1
Philosophy 61	3		1½
Religion 101	2		½
	15	9	15

G. E. 16 (Mech. of Mater.)	4		4
G. E. 66 (Materials Lab.)		3	1
Physics 14 (General Physics)	3		3
Physics 15 (Physics Lab.)		6	2
M. E. 16 (Mach. Drawing)		3	1
Engl. 14 (Tech. English)	2		2
Philosophy 62	3		1½
Religion 102	2		½
	14	12	15

* This curriculum applies to students who matriculate Fall Semester, 1950.
** This curriculum applies to students who matriculated before Fall, 1950.

ELECTRICAL ENGINEERING

**Sub-Senior Year

	R	L	U		R	L	U
G. E. 115 (Mechanics-Dynamics)	2		2	G. E. 116 (Mech.-Fluids)	2		2
G. E. 165 (Mechanics Lab.)		3	1	G. E. 166 (Fluids Lab.)		3	1
E. E. 125 (Elect. and Mag. Cir.)	3		3	E. E. 126 (Elect. Machs.)	3		3
E. E. 175 (Elect. Circuits Lab.)		3	1	E. E. 176 (Elect. Mach. Lab.)		3	1
M. E. 125 (Heat Power)	3		3	M. E. 126 (Heat Power)	3		3
M. E. 175 (M. E. Lab.)		3	1	M. E. 176 (M. E. Lab.)		3	1
M. E. 191 (Mach. Design)		6	2	Phys. 104 (Elect. Meas.)	1	3	2
Philosophy 63	3		1½	Philosophy 64	3		1½
Religion 103	2		½	Religion 104	2		½
	13	15	15		14	12	15

**Senior Year

Same as four-year Senior program, omitting Philosophy and Religion.

MECHANICAL ENGINEERING

**Sub-Senior Year

G. E. 115 (Mech. Dynamics)	2		2	G. E. 116 (Mech. of Fluids)	2		2
G. E. 165 (Dynamics Lab.)		3	1	G. E. 166 (Fluids Lab.)		3	1
E. E. 125 (Elec. and Mag. Cir.)	3		3	E. E. 126 (Elect. Mach.)	3		3
E. E. 175 (Elect. Lab.)		3	1	E. E. 176 (Elect. Lab.)		3	1
M. E. 125 (Heat Power)	3		3	M. E. 126 (Heat Power)	3		3
M. E. 175 (M. E. Lab.)		3	1	M. E. 176 (M. E. Lab.)		3	1
M. E. 191 (Mach. Design)	1	3	2	M. E. 192 (Mach. Design)	1	3	2
Philosophy 63	3		1½	Philosophy 64	3		1½
Religion 103	2		½	Religion 104	2		½
	14	12	15		14	12	15

**Senior Year

Same as four-year Senior program, omitting Philosophy and Religion.

** This curriculum applies to students who matriculated before Fall, 1950.

COLLEGE OF LAW

INTRODUCTION

The purposes of the College of Law are:

To give a thorough training in the fundamental principles of English and American Law, and the modification thereof peculiar to the State of California;

To guide the student by actual practice in office work and court procedure to a proper application of the principles of law to concrete cases;

Finally, to imbue the student with the correct ethical principles that should govern the legal profession.

The general method of instruction followed is the Case System—an exact discussion of the cases presented in the best manuals with a view to deriving the principles which have determined their decisions. This study of rules and principles is never lost sight of by the professor and is rigidly exacted from the student in all examinations.

Lectures on particular phases of the law are given from time to time by the Faculty and by occasional lecturers.

The College of Law maintains a system of Moot Courts, presided over by members of the Faculty. The Court holds bi-weekly sessions in which cases are argued by students in accordance with approved appellate procedure. On given statements of facts the legal issues involved are thoroughly briefed and argued by student counsel subject to constant instruction, advice and correction of the judges.

Besides the bi-weekly sessions of the Moot Court, an annual public competition known as the Coolidge Competition is held. Prizes are awarded to the winning counsel of the annual Coolidge Competition.

PRE-LEGAL PREPARATION

"Law," observed one of its ablest modern exponents, "is not so much a body of rules as it is a process of reasoning". While the practice of law has become increasingly complex within our own generation and the scope of its informational content greatly broadened, now, as in the past, the emphasis in legal education must continue to be upon the development of ability in synthesis and analysis; of logic in thought and of conciseness and clarity in expression; upon the grasp of broad underlying legal principles and in the understanding of traditional legal techniques. The accomplishment of this task requires that a very substantial ground work be laid before the applicant even enters law school. We expect, therefore, that the student coming to us in the law school shall have had some previous contact with and understanding of the rudiments of political science, of economics and of history; with some ability in formulating his ideas in logical sequence and corresponding ability to express those ideas in concise and clear language. Especially desirable, therefore, are courses in philosophy and logic, mathematics, language, and to some degree in the physical sciences. In brief, the more desirable form of pre-legal education is one which emphasizes skill in reasoning and in synthesis and analysis rather than the mere accumulation of "knowledge" that is of "informational data". Such skills probably can be imparted most effectively by a well co-ordinated liberal education. At some stage in a lawyer's education although not necessarily in the pre-legal phase, he should

obtain a working knowledge of accountancy. Courses in the fine arts, however desirable they may be otherwise, are not recommended for pre-legal students and generally no credit is given for any such courses taken.

ENTRANCE REQUIREMENTS

The College of Law is open to the following classes of students:

1. Those who have the degree of Bachelor of Arts, Bachelor of Science, or their equivalent from this school or a similar degree in satisfactory courses from some other college or university of approved standing and who have maintained an average of 1.5 or better in the upper division of their college work.

2. Those who have successfully completed the first three years of college work either at this university or at some college or university offering satisfactory courses leading to academic degrees and who have maintained an average of 1.5 or better in the work of the junior year.

3. Subject to the vote of the faculty and the recommendation of the Dean, those who have successfully completed, at least, the first three years of college work either at this university or at some other college or university offering satisfactory courses leading to academic degrees but who have not maintained an average of 1.5 or better in the upper division of their college work.

4. Students who have followed courses in the College of Arts and Science at this university for three years and who have maintained an average of 2 in the work of their junior year may satisfy the requirements of the Bachelor's degree in their senior year by following the first year law course and the course in Ethics. Such students will then qualify for the Bachelor of Laws degree after two more years of study in the College of Law.

In computing averages, C = 1, B = 2, and A = 3.

Students of the above classes are admitted as REGULAR STUDENTS.

5. In rare instances those who lack the necessary college credits as specified above but whose experience in business or whose private study has made up for their lack of college training and whose maturity and seriousness, fit them, in the discretion of the Faculty for the study of law. These are SPECIAL STUDENTS. Under no circumstances will the number to be admitted each year exceed the limits prescribed by the ruling of the Association of American Law Schools.

6. All students in the College of Law will be expected to have satisfactorily completed a course in General and Applied Ethics such as is ordinarily completed by graduates of the College of Arts and Sciences. This requirement may be fulfilled before entrance to the College of Law. However students who have not fulfilled this requirement before entrance will be required to do so during their first year of attendance in the Law School. In such event no additional fee will be charged for the course. For detailed description of the course in Ethics see Phlosophy 151 and Philosophy 152.

Law School Admission Test. Law School applicants are not required to take the Law School Admission Test administered by the Educational Testing Service, but are urged to do so whenever possible. In any borderline case involving an application weight will be given to results received in such tests. Applicants intending to take the test may obtain detailed

information by writing to the Educational Testing Service, P. O. Box 592, Princeton, New Jersey, or P. O. Box 9896, Los Feliz Station, Los Angeles 27, California.

Advanced Standing

Any person who has been in regular attendance for at least one academic year at another law school, having similar admission requirements, and approved either by the American Bar Association or the Association of American Law Schools, may in the discretion of the Faculty of the College of Law, and on such terms as it may prescribe, receive credit for the work done at such other law school not exceeding in any case two years. The last year must be spent in residence in the College of Law.

First year students who fail to attain an overall C average at the end of the first year may be required to withdraw from the College of Law. No student will be permitted to register for the work of the third year unless he has attained an overall C average in the work of the second year.

GRADUATION REQUIREMENTS

In order to graduate, the student must—

1. Have received credit for at least 76 units (a unit is the equivalent of one hour a week for one semester) of Law exclusive of Survey of Accounting. No student is allowed a unit in any course at which he has not been present for 90 percent of the class hours and in which his average is not at least of D grade. The credit may be earned in part on the basis of work done in other law schools on the part of students admitted to advanced standing as specified above.

2. Have obtained in the work of his third academic year a general grade point average of C with a weighted average of C for the work of the entire three years.

3. Have fulfilled the requirements of residence for three academic years in either this College of Law or some other approved law school, the last academic year of which in any event must have been spent in this College of Law.

The degree of BACHELOR OF LAWS will be conferred on those students:

a. Who possess academic degrees before beginning the study of law and have satisfied the requirements set down in 1, 2 and 3 above.

b. Who have completed three years of college work leading to an academic degree and have satisfied the requirements set down in 1, 2 and 3 above.

c. Special students who throughout their course have satisfied the requirements set down in 1, 2 and 3 above.

No student in the College of Law is allowed to take the State Examination for admission to the Bar before he has completed successfully the course of study prescribed by the University for the LL. B. degree, and until such successful completion of the course has been certified to by the Dean of the College of Law. Immediate exclusion from the College of Law will follow any violation of this regulation.

In addition to the above requirements, a student will be required to write two acceptable law notes; one to be written during his first year, and the second to be written prior to his graduation.

Attendance

Regular attendance at all classes is required. No student while in attendance at this school shall be registered in any other school or college or in any other department of the University of Santa Clara without the written consent of the Dean except those students who qualify under paragraphs four and six of this section titled Entrance Requirements.

THE COOLIDGE COMPETITION

This competition, established in 1934 in honor of Dean Emeritus Clarence C. Coolidge, consists in the public trial of a suppositious case before a bench of three judges chosen from the appellate courts of the State. The competing counsel, two on each side, are chosen from the students who compete in the bi-weekly Moot Court sessions of the College of Law. Suitable prizes are awarded to the successful counsel. The competition serves as a climax to the Moot Court work of the student throughout the school year. Its purposes are to stimulate among the students the desire for legal research and to develop their power for legal analysis.

DESCRIPTION OF COURSES

BIOLOGY

Students who wish to make Biology their major subject must complete Chemistry 1A and 1B as well as Biology 21 and 22 with at least a grade of C before beginning any of the upper division courses in Biology.

The major program must include at least 18 units of upper division courses in Biology and at least six units in either Physics or Chemistry. A grade of C must be maintained in all courses of the major, and, at the end of the senior year, each student must pass a comprehensive final examination.

21. **General Zoology.** An introduction to the broader principles of animal biology. Topics treated to include: protoplasm, the cell, metabolism, organ systems, adaptations, inheritance, etc. The lectures are supplemented by the laboratory study of certain animal forms. Two hours lecture, six hours laboratory. Fall semester. Four units.

22. **General Zoology.** A continuation of Biology 21. Two hours lecture, six hours laboratory. Spring semester. Four units.

Biology 21 and 22 are prerequisite to all other courses of this department except Biology 23-24.

23-24. **General Biology.** An introductory course dealing with fundamental biological processes and principles. It is designed to meet the needs of those who do not plan to proceed to more advanced work in Biology. Laboratory work is designed to illustrate and supplement the lectures. Three hours lecture, three hours laboratory. A successful completion of first semester is required to register for Spring semester. Both semesters. Eight units.

Prerequisite: H. S. — Chemistry is desirable.

101. **Vertebrate Anatomy.** A comparative study of the structure, organization, adaptation and classification of the vertebrate animals. In the laboratory the student dissects the dogfish, necturus and the cat. Two hours lecture, six hours laboratory. One semester. Four units.

102. **Vertebrate Embryology.** A study of the processes of cell division, gametogenesis, fertilization, cleavage, gastrulation, germ layer formation, organogenesis and the extra-embryonic membranes. In the laboratory the processes of development are studied from gross material and serial sections. Particular attention is given to the amphibian, bird and mammal. Two hours lecture, six hours laboratory. One semester. Four units.

Prerequisite: Biol. 22 and 101.

103. **Invertebrate Zoology.** The anatomy, classification and life histories of the invertebrates. Two hours lecture, six hours laboratory. One semester. Four units.

104. **History of Biology.** The history of the development of Biology in its various branches to their present status, with biographical sketches of the leaders in each field. The outlook for the future. Two hours lecture. One semester. Normally restricted to Senior students in Biology. Two units.

105. **Taxonomy and Ecology.** A course designed to acquaint the student with the principles of classification and ecology as evidenced by certain animal groups. Emphasis is laid upon field work. One hour lecture, three hours laboratory. First semester. Two units

106. **Taxonomy and Ecology.** A continuation of Biology 105. One hour lecture, three hours laboratory. Spring semester. Two units.

107. **General Histology.** A study of the cell and the cellular structure and histogenesis of the basic types of tissues. Prerequisites: General Zoology and Vertebrate Anatomy. Two hours lecture, six hours laboratory. Four units.

108. **Special Problems.** Individual work in some specialized branch of biology may be undertaken by senior students who have shown exceptional ability. Hours and units to be arranged.

109. **Histological Technique.** A laboratory course, supplemented by lectures and demonstrations, in the principles and use of apparatus commonly in use in biological laboratories, together with practical instruction in the more commonly used methods of preparing biological material for microscopic study. Six hours laboratory. Prerequisite: Biology 101 and Biology 107. Two units.

110. **Heredity.** An introductory course designed to give a working knowledge of the fundamental principles governing inheritance in plants and animals. Two hours lecture. One semester. Normally restricted to Senior students in Biology. Two units.

CHEMISTRY

Minimum requirements for a degree of Bachelor of Science in Chemistry will comprise the following preparative courses as outlined by the Chemistry Department — Chemistry 1A and 1B; Chemistry 10A and 10B; Chemistry 30A and 30B; Physics 1-4; Mathematics 1, 2, 41, 42, 43, and 44; English, one year, including the writing of some technical paper or report. A grade of C must be maintained in each course.

The major program must include the upper division courses in chemistry, including Chemistry 150A, 150B, 150C, and Chemistry 180 (methods of research and senior thesis). In addition, from eight to ten units of advanced topics in chemistry must be taken. These topics may include two or more courses in the upper division series, listed in which are courses in advanced organic chemistry, biochemistry, advanced analytical chemistry, advanced inorganic chemistry and selected topics in physical chemistry. Two full years of chemistry are required before admission to any of these advanced courses. Further requirements include a reading knowledge of German or French, preferably German. It is highly recommended to have more than one year of college physics.

1A. (5)* **Inorganic Chemistry.** A study of the fundamentals and properties of the elements and compounds with solution of problems. Includes a thorough discussion and mastery of the laws and theories of chemistry. Three hours lecture, six hours laboratory. Fall semester. Five units.

1B. (6)* **Inorganic Chemistry.** A continuation of Chemistry 1A. The laboratory study includes a course in qualitative analysis, consisting of a systematic analysis of cations and anions, together with quizzes and solution of illustrative problems. Three hours lecture, six hours laboratory. Spring semester. Five units.

2A. (11)* **General Chemistry.** Discussion of elementary principles and properties of the more important elements with their compounds. Includes a systematic study of important theories. Laboratory and quiz to accompany the lectures. This course is designed to meet the science needs

*Bracketed numbers refer to catalogue 1945-46.

of those who do not plan to proceed to more advanced work in chemistry. Three hours lecture, three hours laboratory. Fall semester. Four units.

2B. General Chemistry. A continuation of Chemistry 2A. Descriptive study of the elements is continued, together with a brief study of qualitative analysis. Spring semester. Three hours lecture, three hours laboratory. Four units.

3A. (7)* General Chemistry. Fundamental laws of chemistry. Chemical equations. Properties of elements and compounds. Application of chemical principles and calculations to engineering projects. This course is intended primarily for engineering students. Two lectures, six hours laboratory. Fall semester. Four units.

3B. (8)* General Chemistry. A continuation of Chemistry 3A. The laboratory work presents an introduction to the methods of detecting metals and non-metals commonly encountered in engineering practices. Two hours lecture, six hours laboratory. Spring semester. Four units.

10A. (9)* Quantitative Analysis. Introduction to the common methods of volumetric analysis. Analytical problems in acidimetry, alkalimetry, oxidimetry, and volumetric precipitations. Lectures, discussions and quizzes. Two hours lecture, six hours laboratory. Fall semester. Four units.

10B. (10)* Quantitative Analysis. Introduction to the common methods of gravimetric analysis. Methods of electrolytic deposition and colorimetry. Lectures, discussions and quizzes. Two hours lecture, six hours laboratory. Spring semester. Four units.

14. (17)* Quantitative Analysis. A study of both gravimetric and volumetric analysis. Intended primarily for Pre-Medical students. Two hours lecture, six hours laboratory. Fall semester. Four units.

30A. (130)* Organic Chemistry. The Aliphatic Compounds. Introduction to organic chemistry. A course dealing with the chief classes of the chain compounds of carbon. Includes preparative work and a brief introduction to qualitative organic chemistry. Three hours lecture, six hours laboratory. Fall semester. Five units.

30B. (131)* Organic Chemistry. The Aromatic Compounds. A continuation of Chemistry 30A, but dealing with the cyclic compounds. Discussion of carbohydrates is included, as well as an introduction to the chemistry of heterocyclic compounds. Three hours lecture, six hours laboratory. Spring semester. Five units.

34A. Organic Chemistry. A discussion of the principal compounds of an organic nature in the aliphatic series, together with a laboratory study of their principle properties. The role of organic chemistry in life processes briefly reviewed. Intended primarily for Pre-medical students. Three hours lecture, three hours laboratory. One semester. Four units.

34B. Organic Chemistry. A continuation of 34A, but dealing with cyclic compounds including carbohydrates. Introduction to Heterocyclic compounds, medicines, etc. Three hours lecture, three hours laboratory. One semester. Four units.

54. (18)* Physical Chemistry. An elementary course reviewing those principles having important applications in the medical sciences. Intended for Pre-medical students. No laboratory. Two hours lecture. One semester. Two units.

101-102. Advanced Inorganic Chemistry. Discussion of the Basic Atomic Structure, Valence, Radioactivity, Isotopes and Periodic Law. Con-

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sideration of several typical families in relation to the Periodic Classification. Preparation and properties of less common elements such as the Rare Earths and transuranium elements. Two lectures each semester. Four units

103-104. Inorganic Preparations. Methods of purification of impure inorganic substances, preparation of inorganic compounds by high temperature, gas train and electrolytic methods. A course of advanced laboratory technique. Two three hour laboratory periods per week. Credit hours to be arranged

107. Wet Assaying. The application of standard chemical procedures to a systematic analysis of the composition of metalliferous ores and metallurgical products. This course is designed to conform to the requirements of students interested in metallurgical engineering. Prerequisite: Chemistry 3A and 3B. Six hours laboratory per week. One semester. Two units.

115. Food Analysis. Quantitative organic analysis of food products; alcohols, carbohydrates, fats and oils, nitrogenous bodies. Analyses and methods of analysis pertinent to agricultural products. Prerequisites Chemistry 30A, B; Chemistry 10A, B. Six hours laboratory. One semester. Two units.

132. Heterocyclic Chemistry. An intensive study of the preparation and reactions of the quinolines, isoquinolines, pyridines, as well as the oxygen and sulphur analogues. Discussion of liquid ammonia reactions and survey of the ammonia system. Metal salts of nitrogen heterocycles and subsequent reactions. Prerequisites—Chemistry 30A and 30B. Two hours lecture. One semester. Two units.

133. Identification of Organic Compounds. A lecture and laboratory course dealing with the identification, classification and reactions of organic compounds. Laboratory work will also include quantitative determinations of carbon, nitrogen, hydrogen, halogen and sulphur. Prerequisite—Chemistry 30A and 30B; Chemistry 10A and 10B. Two units.

135. Theories of Organic Chemistry. A comprehensive study of the structure of organic compounds, including an evaluation of the present theories considered from an analysis of resonant structures. Discussion of mechanics of classical rearrangements and tautomeric equilibria. Selected topics in infra red absorption, technique as applicable to determination of composition. Prerequisites—Chemistry 30A and 30B. Two hours lecture. One semester. Two units.

140A. Biochemistry. Lectures on the chemical substances which are found in animals and plants, the changes which they undergo in the animal body, and on the physico-chemical laws governing the life processes. Prerequisites—Chemistry 30B and 10A and 10B. Two lecture hours. Two units.

140B. Biochemistry. Continuation of Chemistry 140A. Second semester. Prerequisites Chemistry 140A. Two lecture hours. Two units.

140C. Biochemistry. Laboratory work to accompany Chemistry 140A. One laboratory period of three hours each per week. Fall semester. One unit.

140D. Biochemistry. Laboratory work to accompany Chemistry 140B. One laboratory period of three hours each per week. Second semester One unit.

150A. (150)* Physical Chemistry. A general course, primarily for students making chemistry their major subject, covering the laws and theories of chemical systems as applied to their equilibrium and energy relationships. Prerequisites—Chemistry 1A and 1B; Chemistry 10A and 10B; Chemistry 30A and 30B; one year of college physics, and a working knowledge of calculus. Three hours lecture. Fall semester.
Three units.

150B. (151)* Physical Chemistry. A continuation of Chemistry 150A. Credit in Chemistry 150A, together with satisfactory preparation in physics and calculus. Three hours lecture. Spring semester.
Three units.

150C. Physical Chemical Measurements. Exercises in the practice of physical chemical laboratory methods. Prerequisites—Chemistry 10A and 10B; one year of college physics; concurrent or previous enrollment in Chemistry 150B. Six hours laboratory. Two units.

151. Thermodynamics in Chemistry. A study of the principles of the three fundamental laws of energy as applied to chemical problems. Prerequisites, calculus and Chemistry 150A. Two units.

152. Colloids. A course of lectures in colloid science with special emphasis on industrial applications. The lectures will be briefly descriptive. Prerequisites—one year of college chemistry and one year of college algebra. A knowledge of the fundamentals of organic Chemistry is desirable, but not required. Two units.

160. Chemical Literature and Nomenclature. A consideration of primary and secondary sources of scientific work, including foreign journals and publications, books and library facilities. Methods of compiling bibliographies. A systematic study of accepted organic and inorganic nomenclature. One lecture per week. One unit

170. History of Chemistry. A course in the history of chemistry and the development of chemical theories. Role of Catholic scientists in the development of present day concepts of chemical changes. Lectures, library work and presentation of reports. One semester. Two units.

180. Methods of Research. Students majoring in chemistry are required to undertake work of research or other advanced laboratory work along lines not covered by the courses already listed, under the direction of any member of the teaching staff with whom arrangement is made. The results of this research are incorporated in their senior thesis. Credit hours to be arranged. Both semesters.

CIVIL ENGINEERING

6. Surveying. Theory, use and adjustment of tape, compass, level, transit and plane table. Land and city surveying. Topographic surveying and methods of computing areas. Two hours lecture. Two units.
Prerequisite: Math. 41.

7. Surveying. A continuation of C. E. 6. One hour lecture.
Prerequisite: C. E. 6. One unit.

8. Summer School of Surveying. Field and office work. Practical problems in highway, railway and topographic surveying. Four weeks immediately following the second semester of the sophomore year. Fee $25.00.
Prerequisite: C. E. 7. Four units.

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57. Surveying Practice. Field methods in the use of the tape, compass, level and transit. Six hours field practice.
Prerequisite: To accompany C. E. 7. Two units.

58. Surveying Practice. Practice in solar and stellar observations for the determination of azimuth, latitude, longitude and time. Three hours field practice.
Prerequisite: C. E. 57. One unit.

109. Route Surveying. Simple, compound, reverse and transition curves. Vertical curves. Earthwork and the mass diagram. Two hours lecture.
Prerequisite: C. E. 57. Two units.

116. Transportation Engineering. Design, construction and maintenance of roads and pavements. Two hours lecture.
Prerequisite: Senior standing. Two units.

117. Sanitary Engineering. Collection, purification and disposal of sewage. Sewage treatment works. A study of source, the quality and quanity of water necessary for a municipal supply. Works for the collection, purification and distribution of water. Four hours lecture.
Prerequisite: Senior standing. Four units.

118. Transportation Engineering. Organization and administration of railroads. Methods and practice of railroad location, maintenance and reconstruction. Three hours lecture.
Prerequisite: Senior standing. Three units.

119. Sanitary Engineering. The design of sewerage systems and structures. One hour lecture.
Prerequisite: Senior standing. One unit.

120. Sanitary Engineering. The bacteria in natural water and the quantitative bacteriological examination of water. Two hours lecture.
Prerequisite: Senior standing. Two units.

122. Structures. Analytical study of framed trusses, with fixed loads. Plate girders and industrial buildings. Analysis of bridge trusses with dead, live, impact and lateral loads. Four hours lecture.
Prerequisite: G. E. 16. Four units.

123. Structures. Deflection of trusses and trusses with redundant members. Wind stress analysis of buildings. Continuous frames and secondary stresses. Moment distribution method of analysis. Two hours lecture.
Prerequisite: C. E. 122. Two units.

124. Reinforced Concrete. Principles and practice of reinforced concrete as applied to beams, girders, floor slabs, columns and footings. Reinforced concrete structures. Four hours lecture.
Prerequisite: C. E. 123. Four units.

125. Structures. Methods of design of steel, timber and concrete structures. Two hours lecture.
Prerequisite: C. E. 122. Two units.

126. Soil Mechanics. A study of the origin, composition, characteristics and structural properties of soils. Two hours lecture.
Prerequisite: Senior standing. Two units.

131. Sanitary Engineering. Collection, purification and disposal of sewage. Sewage treatment works. A study of the source, quality and

quantity of water necessary for a municipal supply. Works for the collection, purification and distribution of water. Three hours lecture.
Prerequisite: G. E. 166. Three units.

133. Sanitary Engineering. The design of sewerage systems and structures. Two hours lecture.
Prerequisite: Senior standing. Two units.

134. Sanitary Engineering. The bacteria in natural water and the quantitative bacteriological examination of water. Two hours lecture.
Prerequisite: Senior standing. Two units.

142. Transportation Engineering. Design, construction and maintenance of roads and pavements. Two hours lecture.
Prerequisite: Senior standing. Two units.

144. Transportation Engineering. Organization and development of state and local highway administration. Development of highway systems. Highway financing. Municipal highway departments. Two hours lecture.
Prerequisite: Senior standing. Two units.

151. Graphic Problems. Graphic solutions of static problems. Six hours lecture and drafting.
Prerequisite: To accompany C. E. 101. Two units.

152. Structural Design. The design of the roof truss and the supporting columns of a mill building. Shop drawing of the structure. Six hours lecture, computation and drafting.
Prerequisite: To accompany C. E. 102. Two units.

153. Structural Design. The design and drawing of a single track railway plate girder. Six hours lecture, computation and drafting.
Prerequisite: To accompany C. E. 103. Two units.

154. Structural Design. The design of a through riveted steel bridge truss. The analysis and design of a small concrete structure. Six hours lecture, computation and drafting.
Prerequisite: C. E. 153. Two units.

159. Surveying Practice. Field practice in laying out simple, compound, reverse and transition curves. Three hours field practice.
Prerequisite: To accompany C. E. 109. One unit.

160. Structural Design. The design and shop drawing of steel structures. For Mechanical Engineering students. Six hours lecture, computation and drafting.
Prerequisite: Senior standing. Two units.

166. Transportation Laboratory. Standard methods of testing bituminous and non-bituminous highway materials. Six hours laboratory.
Prerequisite: To accompany C. E. 116. Two units.

167. Sanitary Laboratory. Standard practice in the common tests of sanitary and industrial wastes and polluted and contaminated waters. Three hours laboratory.
Prerequisite: To accompany C. E. 117. One unit.

168. Sanitary Laboratory. Laboratory work in the bacteriological examination of water. Three hours laboratory.
Prerequisite: To accompany C. E. 120. One unit.

169. Sanitary Design. The design of sewerage systems and structures. Six hours computation and drafting.
Prerequisite: To accompany C. E. 119. Two units.

170A. Thesis. The investigation of some engineering problem and the writing of an acceptable thesis. Conference as required.
Prerequisite: Senior standing. One unit

170B. Thesis. Continuation of C. E. 170A.
Prerequisite: C. E. 170A. One unit.

171A. Graphic Problems. Graphic Solutions of static problems Three hours lecture and drafting.
Prerequisite: G. E. 16. One unit

172. Structural Design. The design of the roof truss and the supporting columns of a steel mill building. Shop drawing of the structure. Six hours lecture, computation and drafting.
Prerequisite: To accompany C. E. 122. Two units.

173. Structural Design. Designs of columns, beams, and girders. Design of railway plate girder. Six hours lecture, computation and drafting.
Prerequisite: To accompany C. E. 123. Two units.

174. Structural Design. Design of a welded or riveted bridge truss. Design of a small reinforced concrete structure. Three hours lecture, computations and drafting. Second semester.
Prerequisite: C. E. 123. One unit.

175. Structural Design. Design of timber and concrete structures. Three hours lecture, computation and drafting.
Prerequisite: To accompany C. E. 125. One unit.

176. Soils Laboratory. Field and laboratory practice in the collection and examination of the physical properties of soils. Three hours laboratory.
Prerequisite: To accompany C. E. 126. One unit.

181. Sanitary Laboratory. Standard practice in the common tests of sanitary and industrial wastes and polluted and contaminated waters. Three hours laboratory.
Prerequisite: To accompany C. E. 131. One unit.

183. Sanitary Design. The design of sewerage systems and structures. Three hours computation and drafting.
Prerequisite: To accompany C. E. 133. One unit.

184. Sanitary Laboratory. Laboratory work in the bacteriological examination of water. Three hours laboratory.
Prerequisite: To accompany C. E. 134. One unit.

192. Transportation Laboratory. Standard methods of testing cement, sand, gravel and other non-bituminous highway materials. Three hours laboratory.
Prerequisite: To accompany C. E. 142. One unit.

194. Transportation Laboratory. Standard methods of testing bituminous highway materials. Three hours laboratory.
Prerequisite: To accompany C. E. 134. One unit.

ECONOMICS

Students who wish to make Economics their major subject must have completed Economics 1A and 1B with an average grade of at least C.

The major program must include 24 units of upper division work in economics including Economics 100, 110, 114, and 116. In addition to the units in economics the student must include six units in political science.

An average grade of C must be maintained in all courses of the major, and at the end of the senior year each student must be ready to pass a comprehensive final examination, written or oral.

Lower Division Courses

The following courses are open to students in all departments of the University, subject to the indicated prerequisite, if any.

Students whose major is Economics may elect Economics 10A and 10B in satisfaction of upper division requirements in economics toward graduation.

1A-1B. Principles of Economics. The student is made acquainted with the general principles, terminology and methods of analysis essential to an understanding of economic processes and problems. The work of the course centers around the four dominant phases of economics: consumption, production, exchange. and distribution. Three hours lecture. Two semesters.
Prerequisite: Sophomore standing. Six units.

8. Economic Geography. Includes the study of the physical aspects of the earth as a planet, and the varied environments which it provides for the habitat of man. Different human economies and their relationships to the principal natural environments comprise a large part of the course. In addition, the cultural aspects of some phases of human existence are included, such as political geographical settlements, urban life, etc. Two units.

10A. Principles of Accounting. A study of the basic principles underlying modern accounting processes with particular emphasis upon their application to the technique of classifying and recording actual business transactions. Three hours lecture, three hours laboratory. Fall semester.
Prerequisite: Sophomore standing. Four units.

10B. Principles of Accounting. A continuation of Economics 10A. Special attention is given to the problems peculiar to the sole proprietorship, partnership and corporation. Elementary ideas on the problem of asset valuation are also discussed. Three hours lecture, three hours laboratory. Spring semester.
Prerequisite: Economics 10A. , Four units.

11. Introduction to Business. A study of the structure and functioning of business enterprise with emphasis upon the principles and methods of business. One hour lecture. Two semesters. Two units.

12. Job Analysis. The course includes an analysis of the various types and kinds of jobs, getting leads, enacting sample interviews, preparing individual brochures, etc. One unit.

16. Mathematics of Finance. Algebraic computations: use of equations in bonus and tax problems and in the determination of net worth of interowned companies. Actuarial science: compound interest, amounts, and present values; nominal and effective interest rates; sinking fund computations; debt amortizations; bond valuations at yield rates. Three hours lecture. One semester.
Prerequisite: Math 15. Three units.

30A-B. Survey of Accounting. This course is designed to meet the needs of students who contemplate the practice of law. To that end the phases of accounting treated are those which involve a consideration of partnerships, corporations, ventures, syndicates, estates, trusts, insolvent

enterprises, and the problems involving asset valuation in public utility rate cases. Two hours lecture. Two semesters. Four units.

Upper Division Courses

100. **Principles of Statistical Method.** The object of this course is twofold: Firstly, it presents the techniques of elementary statistical analysis as tools appropriate for the study of quantitative data. Secondly, it considers the logic of statistical induction and the inherent limitations imposed thereon by the nature of the data themselves. The subject matter includes averages, variation, elementary ideas of index numbers, simple linear correlation and elementary time series analysis. Three hours lecture, three hours laboratory.
Prerequisite: Mathematics 1. Four units.

116. **American Economic History.** A study of the economic history of the United States, with special reference to problems arising from the factory system and large scale production. Three hours lecture. Three units.

117. **European Economic History.** A study of the development of the economic aspects of civilization in medieval and modern times. Special attention is given to the evolution of economic institutions and the historical background of the economic problems of the present. Three hours lecture. Three units.

Group A

All courses in this group are open to anyone who has passed Economics 1A-1B with a grade of at least C and who has fulfilled the specific prerequisite of the course in question.

110. **History of Economic Doctrines.** A survey of economic theories and doctrines from Plato to Alfred Marshall. The various types of theory are contrasted and compared and their relationship to the general economic and social history of the period indicated. Three hours lecture. Three units.

114. **Economic Theory.** An analysis of cost and price relationships in the individual firm and in the industry of which it is a part. The three special cases of pure competition, monopolistic competition, and pure monopoly will be discussed. No attempt will be made to discuss the distribution of the "national dividend". Distribution will be discussed only in terms of the pricing process; that is, only so far as factors of production must be considered in making adjustments to cope with new price-cost relationships. Three hours lecture. Three units.

120. **Public Finance and Taxation.** A course devoted to the analysis of public expenditures and public revenues. In the case of expenditures, particular emphasis will be placed on the change in the qualitative nature of those expenditures when commanded by government and the effects of such changes on the private economy. The section of the course devoted to public revenues will consider taxes peculiar to the United States in such a way as to determine the ultimate bearers of the burden of those taxes. Three hours lecture. Three units.

122. **Money and Banking.** An analysis of the fundamental concepts of money. The discussion of money will be followed by an analysis of commercial banking principles. Emphasis will be placed upon the commercial bank as a "manufacturer of the means of payment." The discus-

sion of commercial banking will, of necessity, entail consideration of the philosophy, technique and policy of central banking. Mindful of the fact that the United States possesses a monetary and banking system peculiar to itself, consideration will be given to "money of the United States," the National Banking System and the Federal Reserve System, whenever possible or necessary. Three hours lecture. Spring semester.
Three units.

126. Business Cycles. An introduction to the analysis of fluctuations in the level of general business activity. Specific theoretical formulations explaining business cycles will be discussed. This will be followed by a discussion of the history of business fluctuations, the problem of control and the attainment of stability. Three hours lecture.
Prerequisite: Economics 100. Three units.

150. Labor Problems. Lectures and class discussion on (1) the problems: insecurity, wages and income, hours and work periods, sub-standard workers, industrial autocracy; and (2) attempts to solve them: by employees, by employers, by government. Three hours lecture. Three units.

180. International Trade. It is the purpose of this course to present the generally accepted results of the theoretical investigations of the past, and then to give the student the modern doctrine of the manner in which international adjustment to economic change occurs. The theories and operation of foreign exchange and its economic influence upon industry and trade will be considered in order that the student may be thoroughly acquainted with the analytical tools that are available for use in understanding the importance of government policy in international trade. Three hours lecture. Three units.

181. Principles of Marketing. The nature and importance of marketing; nature of producer and consumer; extent of and forces behind markets; marketing functions; cooperative marketing; methods and channels of distribution; the transportation problems connected with marketing; market price; government authority; trends in present marketing methods and policies. Three hours lecture. Three units.

Group B

Enrollment in all courses in this group is limited to students registered in the College of Business Administration.

121. Corporation Finance. An introduction to the problems surrounding the procurement of funds needed for carrying on a modern business enterprise. Topics covered will include: financial organization of modern industry; the instruments of enterprise finance; promotion and sale of securities; financing of operations of the going-concern; problems of financing growth and expansion; financial readjustments. Three hours lecture. Three units.

124. Investments and Investment Institutions. As Corporation Finance deals with the problems of business management devising ways and means of procuring funds for enterprise operations, so this course will deal with the market for funds as viewed by those individuals and institutions who are offering those funds in that market. Therefore, among the subjects to be considered will be the nature of the money market; institutions operating therein; and because of the significance of the presence of government, government control thereof. It will be presumed that a student electing this course possesses a working knowledge of commercial and central bank operations and of the fundamentals of enterprise finance. Three hours lecture. Three units.

125. **Problems in Corporation Finance.** A detailed analysis of specific problems in corporation finance. The background and needs of those enrolling will determine the specific topics covered.
Units by arrangement.

127. **Problems in Public Finance.** A continuation of Economics 120. Attention will be given to current problems in fiscal matters.
Prerequisite: Consent of instructor. Units by arrangement.

130. **Accounting Valuation.** A study of the theory and technique applied in the valuation of assets and liabilities in the preparation of private enterprise balance sheets and profit and loss statements. Consideration will also be given, where appropriate, to the similarities and differences between the accountants' problem of valuation and the economists' problem of value.
Prerequisite: Economics 10B. Three units.

131. **Accounting: Proprietorship.** Problems arising from the existence of more than one proprietor in an enterprise will be discussed as well as the techniques and theory underlying the accounting for interests in the net worth of an enterprise and changes therein. About one third of the course will be devoted to partnerships and the remaining two-thirds to corporations.
Prerequisite: Economics 130. Three units.

132-A. **Accounting Problems.** The theory and technique underlying the preparation of statements for certain situations will be discussed and illustrative problems solved. Among the topics discussed will be bankruptcy, installment sales, branch accounting, estates and trusts, and public accounts. Other special problems by arrangement with the instructor.
Prerequisite: Economics 131. Units by arrangement.

132-B. Continuation of 132-A, with emphasis on parent and subsidiary accounting.
Prerequisite: 132-A. Units by arrangement.

133. **Cost Accounting.** A study of the problems involved in recording the internal transactions of modern business enteprise, for use by management in control of activities. Particular emphasis is on industrial concerns but application to trading concerns, both wholesale and retail, are discussed. Particular topics include the determination of unit product costs, departmental costs, allocation of overhead, standard costs and budgetary control. Three hours lecture.
Prerequisite: Economics 10B. Units by arrangement.

134. **Accounting Systems.** The theoretical and practical problems involved in setting up accounting systems will be considered with special reference to the prompt preparation of reports for the use of management and the minimizing of costs of operating the system.
Prerequisite: Economics 131. Units by arrangement.

135. **Analysis of Financial Statements.** This course is concerned with the interpretation of the statistical significance of the numerical data compiled from accounting and supplementary records. Emphasis is placed upon statistical interpretation of the typical financial statements and interim reports prepared for the use of management. Three hours lecture.
Three units.

136. **Industrial Cost Analysis and Research.** This course consists of two parts: (a) advanced study in problems of cost accounting, e. g., investigation of problems of allocation of production costs; analysis and

determination of overhead cost rates; determination of differential production costs; standard setting for standard cost systems; installation of standard cost systems and their use for control; (b) production cost research in representative industrial plants in this geographic area. Two-thirds of the course time will be spent in investigations of real cost problems in these plants. This is to train the student in the practical application of cost techniques to the determination and analysis of firm costs. Three hours. One semester.

Prerequisite: Econ. 133 and Consent of Instructor. Three units.

137. Auditing. This course covers both theory and practice of auditing, discussion being supplemented with problems, questions, specimen working papers applicable to balance sheet audits, and laboratory work illustrating audit procedure. Auditing procedure involved in connection with cash and cash funds, receivables, inventories, investments, deferred charges, capital assets, intangible assets, liabilities, both actual and contingent, accounts showing net worth, closing of an audit, and preparation of audit reports.

Prerequisite: Econ. 131. Three hours lecture. Three units.

138. Income Taxation. This course presents the underlying principles of income taxation and the special accounting and management problems involved in the determination of tax liability. The course develops the concept of taxable income and deals with special problems of individuals, partnerships, trusts, and corporation income taxes. Three hours lecture. One semester. Three units.

140. Mathematical Principles of Finance. A study of the algebraic technique applicable to the solution of problems involving interest and discount. Among the topics discussed will be interest, discount, fund accumulations, debt amortizations, and the rudimentary principles of life insurance premiums and reserve. Attention will also be given to the relationship of this work to students of accounting and of finance. Three hours lecture. Fall semester.

Prerequisite: Mathematics 1. Three units.

160. Industrial Organization Management. The purpose of this course is to give the student a working knowledge of fundamental principles underlying the management of business enterprises. The student is trained in methods of identifying and evaluating the influences upon a business enterprise, and then is given a comprehensive view of modern practices of planning, organizing, and controlling various functional activities in business. Three hours lecture. Fall semester. Three units.

165. Retailing. A study of the organization and management of retail establishments. Among the topics discussed will be: store location; organization; policies; sales systems; profit; turnover; buying; the physical control of inventories; personnel; statistics; summaries for management control. Three hours lecture. Spring semester.

Prerequisite: Economics 160. Three units.

166. Personnel Management. The purpose of this course is to give the students a thorough knowledge of the principles of scientific management and the ability to recognize the limitations and uses of the tools and mechanism of management. Throughout the course, such management devices as present-day industrial tendencies, labor maintenance and control, wage payment and wage incentives, inspection, and cost analysis are studied as aids in clarifying and solving management problems. Three hours lecture. Three units

182. **Marketing Problems.** The philosophy and technique of the scientific method applied to market problems. Practical research procedure; sources of market facts; methods of collecting and treating market data; research agencies; the development of marketing methods and policies based upon the results of market research. Three hours lecture.
Prerequisite: Economics 181. Three units.

183. **Transportation.** An economic analysis of the principle forms of commercial transportation in the United States. The particular problems of rail, water, motor, air, and pipe line transportation are considered. Three hours lecture. Three units

184. **Advertising.** Fundamental principles; an analysis of the important psychological factors in advertising. Human wants; buying motives and reactions are studied to comprehend the effects of various practices and methods of advertising upon consumers and middlemen. Three hours lecture. Three units.

185. **Salesmanship and Salesmanagement.** This course in Salesmanship and Salesmanagement provides the necessary background material for men and women who plan to follow a career in sales. The general topics included will be those which are of the greatest importance to both individuals already in selling as well as people planning to enter the field. Some of the topics which will be discussed include: Salesmanship—How to Develop Selling Ability, the Approach, the Demonstration, the Close, How to Meet Objections, and Sales Personality; Sales Planning—Routing of Salesmen and Sales Quotas, Product Planning and Product Research, Choice of Distribution Channels; Prices and Terms of Sale; Sales Programs and Sales Promotion; Sales Department Organization, Selection, Training, Compensation, and Management of the Sales Force, Inventory Policy and Control; Sales Costs and Budgets; Sales and Market Research. Three hours lecture. Three units.

EDUCATION

A. B. **Prescribed Physical Training for Freshmen.** All Freshmen who are in no way physically defective are required to meet twice a week for physical training. Those who do regular work in baseball, basketball, boxing, football, swimming or tennis are exempt from the physical training classes. Two hours weekly throughout the year. One unit.

6. **A General Course in the History of Education.** Primitive and Oriental. Greek. Roman. Early Christian and mediaeval. Monastic schools and the development of Scholasticism. The founding of universities in the various parts of Europe. Two hours. One semester.
Two units.

7. **Modern Education.** Continuation of Educ. 6. The Renaissance in education. The Reformation and education. The Jesuit system of education. The great educational reformers. The development of the national school systems in Europe and the United States. Two hours. One semester. Two units.

8. **Teacher's Courses in High School English.** The rhetoric to be taught in high school. Its method of presentation and its application to written composition. Graduation and development of written composition. Methods of correction. Standards of evaluation. The literature to be studied. The method for its presentation and study. Oral English. Two hours. One semester. Two units.

101. **History of Education.** The development of educational thought beginning with the Greek and Roman periods to modern times. Embraces in particular the dominant phases of modern education; the influence of Greek and Medieval education on the systems prevalent today. Three hours. One semester. Three units.

102. **Principles of Education.** A survey of the theories and general principles of education considered as affecting the present day social order. Two hours. One semester. Two units.

103. **Educational Psychology.** A study of the mental development of man, mental testing; moral and religious development; general laws of learning. Three hours. One semester.
Pre-requisite: Educ. 101, 102. Three units.

104. **Secondary Education.** A complete survey of secondary education; particular emphasis on the functions, scope and curricula of secondary education in relation to present day social needs. Three hours. One semester.
Prerequisite: Educ. 101, 102. Three units.

105. **Statistical Methods in Education.** Collection of data; measures of central tendency; measures of variability; the normal probability curve; correlation; validity; interpretation of statistical findings. Three hours. One semester.
Prerequisite: Educ. 103. Three units.

106. **Tests and Measurements.** The purpose of measurement in education; standardized tests of intelligence and achievement; other means of evaluating learning. Three hours. One semester.
Prerequisite: Educ. 105. Three units.

108. **Psychology of High School Subjects.** An analysis of the psychological factors affecting the learning of high school subjects; review of experimental studies of the significance in teaching high school subjects. Three hours. One semester.
Prerequisite: Educ. 103. Three units.

ELECTRICAL ENGINEERING

125. **Electric, Magnetic and Dielectric Circuits.** A basic treatment of the fundamental engineering relationships applying to electric, magnetic and dielectric circuits. The phenomena treated underlie all phases of electrical engineering. Circuit principles are applied to polyphase alternating current circuits. Three hours lecture.
Prerequisite: Junior standing in Electrical or Mechanical Engineering. Three units.

126. **Electric Circuits and Machines.** A study of the operating characteristics of direct current generators and motors, transformers, induction motor, synchronous motor and the single-phase motor. Principle features of these electrical devices are discussed in the light of fundamentals previously developed. Three hours lecture.
Prerequisite: E. E. 125. Three units.

127. **Advanced Electric Circuits and Machines.** Circuit fundamentals are applied to the study of single-phase alternating current circuits having non-sinusoidal voltages impressed upon them. Unbalanced polyphase loads are analyzed. Some features of direct current and alternating current machine behavior are developed more fully than in E. E. 126. Basic aspects

of amplidyne generator operation and application are covered. Three hours lecture.

Prerequisites: E. E. 125 and E. E. 126. Three units.

128 A, B, C. **Advanced Alternating Current Machines.** Continuation of E. E. 127 to include harmonic suppression in polyphase transformer banks, special connections of transformers, speed control of induction motors, power angle of alternators and synchronous motors, parallel operation of alternators, and special characteristics of single-phase motors.

128A Two hours lecture. Two units.

128B Three hours lecture. Three units.

128C Four hours lecture. Four units.

Prerequisite: E. E. 127.

131. **Basic Electronics.** Characteristics of high-vacuum and gas filled tubes. Control circuits for gas filled tubes used in direct current and alternating current circuits. Rectifiers and filters. Principal features of the more common types of amplifiers, oscillators, and detectors. Three hours lecture.

Prerequisite: E. E. 125. Three units.

132. **Advanced Electronics.** Continuation of E. E. 131 to more fully develop features of amplifiers, oscillators and detectors. Engineering aspects of amplitude-modulation, frequency-modulation and phase-modulation radio communication systems are treated. Three hours lecture.

Prerequisite: E. E. 131. Three units.

135. **Elements of Electrical Engineering.** A course for Civil Engineering and Industrial Option Mechanical Engineering students dealing with the principles and applications of alternating and direct current circuits and machines. Three hours lecture.

Prerequisite: Physics 12, 13, 14, 15; Math. 33. Three units.

136. **Communications Circuits.** Analytical treatment of the theory of transmission lines and extension of the theory into some of the more common types of filters. Transmission line theory is developed from the point of view of its applications in telephony and radio. Three hours lecture.

Prerequisite: E. E. 126. Three units.

138. **Electric Circuit Transients.** The behavior of electric circuits containing fixed circuit parameters, including some cases of coupled circuits, are analyzed by solution of the applicable differential equations. The solutions are discussed for their applications in electric power systems and in machines. Two hours lecture.

Prerequisite: E. E. 125 and Math. 116. Two units.

140. **Symmetrical Components.** The techniques of the mathematical method of symmetrical components for solution of unbalanced polyphase system problems are developed and applied to study of faults on transmission systems and to the behavior of polyphase machinery operating from unbalanced voltage sources. Two hours lecture.

Prerequisite: E. E. 127. Two units.

142 A, B. **Electrical Illumination.** Spectral characteristics of the more common types of electrical light sources are discussed and specification bases established. Problems are solved for the selection and position of lighting systems to provide specified levels of illumination. Wiring

and control systems are developed for handling the electric lighting power in conformity with Underwriters Laboratories code.

142A Two hours lecture — Two units.

142B Three hours lecture. — Three units.

Prerequisite: E. E. 125.

144. Power Transmission Lines. The behavior of relatively long lines at power frequencies is analyzed. Power transmission limitations and circle diagrams are developed. Effects of power factor correction equipment on current and voltage distribution are treated. The characteristics of these lines that must be considered in carrier current communications and relaying systems are discussed. Two hours lecture.

Prerequisites: E. E. 127 and E. E. 131. — Two units.

146A, B. Ultra-High Frequency Techniques. Characteristics of tubes suitable for generating and amplifying ultra-high frequency power. Some limitations of U-H-F receivers. Principle features of transmission lines, wave guides and resonant cavities at these frequencies.

146A Two hours lecture. — Two units.

146B Three hours lecture. — Three units.

170 A, B. Thesis. Investigation of an approved Electrical Engineering problem and preparation of suitable thesis covering the investigation. Conferences as required. Two units; may be offered both in either the first or second semesters of the Senior year or it may be offered one unit each semester.

Prerequisite: Senior standing in Electrical Engineering. Two units.

171 A, B. Electrical Design. Design of Magnetic Circuits and associated Electric circuits in machines. Calculations of heat generation and dissipation rates in electrical apparatus. Selection of materials for desired electric, magnetic, dielectric and thermal behaviour. Two units.

Three hours lecture and computation per unit. Both units may be offered in either the first or second semesters of the Senior Year or it may be offered one unit each semester.

Prerequisite: E. E. 126. — Two units.

172. Power Generation and Distribution Problems. Principles of engineering economy applied to selection of component equipment for power operation and utilization. Survey of typical capital and operating costs of steam and hydro-electric generating stations. Economic selection of conductor size. Division of load between available generating units and between available services. Location of load centers, power plant sites. Simple short circuit calculations on systems and applications of circuit breakers and relays for system protection. Six hours lecture and computation.

Prerequisite: E. E. 126. — Two units.

175. Electric Circuits Laboratory. Experimental study of basic circuit principles developed in E. E. 125. Opportunity is afforded for exercise in laboratory techniques. Three hours laboratory.

Prerequisite: To accompany E. E. 125. — One unit.

176. Electric Machinery Laboratory. Experimental study, operating characteristics of transformers, induction and synchronous motors, direct current generators and motors, and motor control principles. Three hours laboratory.

Prerequisite: To accompany E. E. 126. — One unit.

177. **Advanced Electric Circuits and Machinery Laboratory.** Continuation of E. E. 176, to treat unbalanced polyphase loads, special tests on direct current machines, the amplidyne generator, and further study of alternating current machines. Three hours laboratory.
Prerequisite: To accompany E. E. 127. One unit.

178. **Advanced Alternating Current Machinery Laboratory.** Laboratory tests and computations on alternating current power equipment characteristics as treated in E. E. 128. Three hours laboratory.
Prerequisite: E. E. 177. One unit.

181. **Electronics Laboratory.** Experimental study of tube characteristics, rectifier circuits, thyratron control systems, cathode-ray oscillograph, some amplifiers and oscillators. Three hours laboratory.
Prerequisite: To accompany E. E. 131. One unit.

182. **Advanced Electronics Laboratory.** Continuation of E. E. 181 to include feedback amplifiers, radio-frequency voltage and power amplifiers, modulation systems, and detector characteristics. Three hours laboratory.
Prerequisite: To accompany E. E. 132. One unit.

185. **Elements of Electrical Engineering Laboratory.** Experimental study of some simple alternating current circuits, and tests to demonstrate operating characteristics of alternating and direct current apparatus. Three hours.
Prerequisite: To accompany E. E. 135. One unit.

188. **Electric Transients Laboratory.** Experimental verification, using the electromagnetic oscillograph, of transient behavior of circuits as treated in E. E. 138. Three hours laboratory.
Prerequisite: To accompany E. E. 138. One unit.

ENGLISH

Students who wish to make English their major subject must complete English 1A-1B, 46A-46B, 51 and 52 with at least a grade of C.

The major program must also include 24 units of upper division English courses. An average grade of C must be maintained in all courses of the major, and, at the end of the senior year, each student must pass a comprehensive final examination.

Subject A. A writing course for those who fail to pass composition placement tests. Two hours until the course is passed. No credit.

1A - 1B. (1, 2, 11, 12)* Introduction to Composition and Literature. Instruction and practice in the technique of good writing together with the reading and analysis of various types of literature. Six units.

14. **Technical English.** A study of clear, precise statements such as are used in specifications, contracts, and engineering reports.
Prerequisite: Junior standing in Engineering. Two units.

46A-46B. (7,8)* Survey of English Literature. History of the literature and readings: A. From the beginnings to the decline of Neo-Classicism; B. From the pre-Romantic period to the present.
Six units.

51. **(5)* Oratorical Composition.** Principles and practice of reasoning and persuasion in written form. Three units.

52. **(6)* Principles of Poetry.** An introduction to the study of poetry, its nature and kinds. Practice in verse composition. Three units.

* Bracketed numbers refer to catalogue 1947-48.

53A-53B. (21)* Journalism. A. Newswriting and the editorial and business portions of newspapers. B. Magazine writing and the editorial and business portions of magazines. Practice and laboratory work in each. Two units.

101. The Essay. An advanced course in the study of the essay, its nature and kinds. Forerunners of the essay. The essay in English with readings in representative English and American essayists down to the present. Three hours. One semester. Three units.

102. Fiction. The nature and kinds of fiction, illustrated by ancient and modern forms in verse and prose. Plot, setting, characters. Special emphasis on modern prose forms. The novel and the short story with appropriate readings. Three hours. One semester. Three units.

103. Shakespeare. A study of the historical background and the influence of Shakespeare in the development of English dramatic literature. Intensive study of at least four plays with further plays assigned for more rapid reading. (Required of all English Majors.) Three hours. One semester. Three units.

104. Milton. His background and spirit. Contrast with Dante, Virgil and Homer. Selections from his prose. His principal minor poems. Comus. Paradise Lost. Three hours. One semester. Three units.

105. Chaucer. Chaucer's medieval background. Dawning influence of the Rennaisance. Relation to later English literature. Diction. Versification. Literary characteristics. Readings from Canterbury Tales and from earlier and later minor poems. Three hours. One semester. Three units.

106. Literary Criticism. Representative critical theories from Plato to the present, and their application to specific literary works. Three hours. One semester. Three units.

107. Comparative Literature. Reading of ancient, mediaeval, and modern classics in English translations. Lectures on the authors and masterpieces of various nations and periods of history, emphasizing their relations to English and American literature. Three hours. One semester. Three units.

108. American Literature. Its historical development briefly reviewed. Points of comparison and contrast with other literatures. Readings from the principal American poets and prose writers. Three hours. One semester. Three units.

109. Browning. Dramatic lyrics; dramatic romances; the dramatic monologue; Pippa Passes; The Ring and the Book. Three hours lecture. Three units.

110. Shakespeare. An extensive reading course in the plays of Shakespeare. A rapid survey of the poet's dramatic work. (For students not majoring in English.) Lectures and assigned readings. Three units.

111. Tennyson. The Lady of Shallot and other poems; English Idylls and other poems; In Memoriam; The Princess; The Idylls of the King. Three hours lecture. Three units.

112. The English Drama. A survey of the English drama from the liturgical period to the end of the Victorian period. Three hours. One semester. Three units.

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*Bracketed numbers refer to Catalogue for 1948-49.

113. The English Rennaisance. Readings in the non-dramatic literature of the Rennaisance period; lectures on the English Renaissance. Three hours. One semester. Three units.

114. (112)* The Neo-Classical Period. The ages of Dryden, Pope, and Johnson, down to and including the Pre-Romanticists, 1660-1798. Three hours. One semester. Three units.

115. The Age of Romanticism. A study of a select number of English writers of poetry and non-fictional prose in the Age of Romanticism, their subject matter, mental traits, and qualities of style. Three hours. One semester. Three units.

116. The Victorian Age. A study of a select number of English writers of poetry and non-fictional prose in the Age of Victoria, their subject matter, mental traits, and qualities of style. Three hours. One semester. Three units.

117. (114)* Creative Writing. A workshop course in the technique of writing current types of imaginative prose. Three hours. One semester. Three units.

EVENING DIVISION COURSES

The following courses which are offered at night do not lead to a degree and do not require definite college preparation. If a student desires college credit for these courses refer to page 61.

Students who desire to work for a degree in Economics must fulfill University entrance requirements as well as degree requirements listed on page 47 or page 56 titled "Upper Division".

Economics

1A. Principles of Economics. The student is made acquainted with the general principles, terminology and methods of analysis essential to an understanding of economic processes and problems. The work of the course centers around the four dominant phases of economics; consumption, production, exchange, and distribution. Three units.

1B. Principles of Economics. Continuation of Economics 1A. Three units.

10A. Principles of Accounting. (Accounting 1A)* A study of the basic principles underlying modern accounting processes with particular emphasis upon their application to the technique of classifying and recording actual business transactions. Three units.

10B. Principles of Accounting. (Accounting 1B)*. A continuation of Economics 10A. Special attention is given to the problems peculiar to the sole proprietorship, partnership and corporation. Elementary ideas on the problems of asset valuation are also discussed. Three units.

16. Mathematics of Finance. (Mathematics of Accounting 2)*. Algebraic computations; use of equations in bonus and tax problems and in the determination of net worth of inter-owned companies. Actuarial science; compound interest, amounts, and present values; nominal and effective interest rates; sinking fund computations; debt amortizations; bond valuations at yield rates. Three units.

130. Accounting Valuation. (Accounting 2A)*. A study of the theory and technique applied in the valuation of assets and liabilities in the

*Bracketed numbers refer to catalogue 1948-49.

preparation of private enterprise balance sheets and profit and loss statements. Consideration will also be given, where appropriate, to the similarities and differences between the accountants' problem of valuation and the economists' problem of value. Three units.

131. Accounting: Proprietorship. (Accounting 2A)*. Problems arising from the existence of more than one proprietor in an enterprise will be discussed as well as the techniques and theory underlying the accounting for interests in the net worth of an enterprise and changes therein. About one-third of the course will be devoted to partnerships and the remaining two-thirds to corporations. Three units.

132A. Accounting Problems. (Accounting Problems 3A)*. The theory and technique underlying the preparation of statements for certain situations will be discussed and illustrative problems solved. Among the topics discussed will be bankruptcy, installment sales, branch accounting, estates and trusts, and public accounts. Other special problems by arrangement with the instructor. Three units.

132B. Accounting Problems. (Accounting 3B)*. Continuation of 132A with emphasis on parent and subsidiary accounting. Three units.

133. Cost Accounting. (Cost Accounting 1)*. A study of the problems involved in recording the internal transactions of modern business enterprise, for use by management in control of activities. Particular emphasis is on industrial concerns but application to trading concerns, both wholesale and retail, are discussed. Particular topics include the determination of unit product costs, departmental costs, allocation of overhead, standard costs and budgetary control. Three units.

137. Auditing. This course covers both theory and practice of auditing, discussion being supplemented with problems, questions, specimen working papers applicable to balance sheet audits, and laboratory work illustrating audit procedure. Auditing procedure involved in connection with cash and cash funds, receivables, inventories, investments, deferred charges, capital assets, intangible assets, liabilities, both actual and contingent, accounts showing net worth, closing of an audit, and preparation of audit reports. Three units.

138. Income Taxation. This course presents the underlying principles of income taxation and the special accounting and management problems involved in the determination of tax liability. The course develops the concept of taxable income and deals with special problems of individuals, partnerships, trusts, and corporation income taxes. Three units.

139A. Advanced Accounting. Corporations; funds and reserves; profit and loss analysis; statement of application of funds; consignments; installment sales. Three units.

139B. Advanced Accounting. Continuation of 139A. Three units.

150. Labor Problems. (Labor Problems 1)*. Lectures and class discussion on (1) the problems: insecurity, wages and income, hours and work periods, sub-standard workers, industrial autocracy; and (2) attempts to solve them: by employees, by employers, by government. Three units.

160. Industrial Organization and Management. (Business Management 1)*. The purpose of this course is to give the student a working

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*Bracketed numbers refer to Catalogue for 1948-49.

knowledge of fundamental principles underlying the management of business enterprises. The student is trained in methods of identifying and evaluating the influences upon a business enterprise, and then is given a comprehensive view of modern practices of planning, organizing, and controlling various functional activities in business. Three units.

166. Personnel Management. The purpose of this course is to give the students a thorough knowledge of the principles of scientific management and the ability to recognize the limitations and uses of the tools and mechanism of management. Throughout the course, such management devices as present-day industrial tendencies, labor maintenance and control, wage payment and wage incentives, inspection, and cost analysis are studied as aids in clarifying and solving management problems. Three units.

181. Principles of Marketing. (Marketing 1)*. The nature and importance of marketing; nature of producer and consumer; extent of and forces behind markets; marketing functions; cooperative marketing; methods and channels of distribution; the transportation problems connected with marketing; market price; government authority; trends in present marketing methods and policies. Three units.

183. Transportation. (Transportation 1)*. An economic analysis of the principle forms of commercial transportation in the United States. The particular problems of rail, water, motor, air, and pipe line transportation are considered. Three units.

184A. Advertising. An analysis of advertising and its main fundamentals, including copy, layout, production, media, campaigns, and operation of Advertising Departments and Agencies. Three units.

184B. Advertising. Continuation of 184A. Three units.

185. Salesmanship and Salesmanagement. (Salesmanship and Salesmanagement 1)*. This course in Salesmanship and Salesmanagement provides the necessary background material for men and women who plan to follow a career in sales. The general topics included will be those which are of the greatest importance to both individuals already in selling as well as people planning to enter the field. Some of the topics which will be discussed include: Salesmanship—How to Develop Selling Ability, the Approach, the Demonstration, the Close, How to Meet Objections, and Sales Personality; Sales Planning—Routing of Salesmen and Sales Quotas, Product Planning and Product Research, Choice of Distribution Channels; Prices and Terms of Sale, Sales Programs and Sales Promotion; Sales Department Organization, Selection, Training, Compensation, and Management of the Sales Force, Inventory Policy and Control; Sales Costs and Budgets; Sales and Market Research. Three units.

English

1E. Effective Communication. Seminar in the principles of "good English." Everyday problems of English will be discussed in relation to informal and formal speech and writing. By emphasizing the potentialities of Modern English rather than the prohibitions of the older grammarians, this course is aimed at giving the mature student confidence in his use of spoken and written language. Attention will be centered especially on the best current practice in business communications. Three units.

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Public Speaking

1E. Public Speaking. Seminar in Composition and Delivery based on Modern Theory and Practice. This course is aimed at building up confidence and ease in the communication of ideas to an audience. Classroom work will be mainly criticism of students' speeches: from these criticisms the principles of composition and delivery will be illustrated and explained. Approximately ten speeches will be required from each student each semester. Two units.

Law

1E. Agency and Sales; Contracts. An analysis of the important business aspects of Contracts, Agency and Sales. Three units.

2E. Negotiable Instruments, Property, Partnerships and Corporations. Besides a thorough analysis of Negotiable Instruments, Property, Partnerships and Corporations, some consideration is given to Bailments and Carriers, and Bankruptcy. Three units.

FRENCH

1. **Elementary French.** In this course the student is carefully drilled in elementary grammar up to the irregular verbs, attention also being given to acquiring a vocabulary of the more common words. Three hours. Fall semester. Three units.

2. **Elementary French.** A continuation of French 1. Special attention is given to the more important irregular verbs, the memorizing of words, and translation of French into English and vice versa. Three hours. Spring semester. Three units.

3. **Intermediate French.** A thorough review of grammar and syntax. The object of this course is to acquaint the student with the general vocabulary and enable him to read the more simple French writers. Three hours. Fall semester.
Prerequisite: French 2. Three units.

4. **Intermediate French.** This course continues the work begun in French 3. Regular exercises are given in written work, and copious reading is made from the standard works in order to fit the student for professional reading. Three hours. Spring semester. Three units.

5-6. **Advanced Composition and Reading.** Compositions and sight reading; oral and written reports in French; conversation; survey of French literature. This course is conducted almost entirely in French. Three hours. Both semesters. Six units.

GENERAL ENGINEERING

1. **Engineering Drawing.** Lettering. Use of instruments. Orthographic projection. Isometric drawing. Oblique drawings. Single auxiliary views. Sections and convention. Fasteners. Dimensioning. A.S.A. Drafting room standards. Six hours lecture and drafting. Two units.

2. **Engineering Drawing.** Theory of projection. Auxiliary views. Revolution. Point, line and plane problems. Development of surfaces. Intersections. Dimensioning and working drawings. Lettering. Drafting room standards. Six hours lecture and drafting.
Prerequisite: G. E. 1. Two units.

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*Bracketed numbers refer to Catalogue for 1948-49.

3. **Orientation.** Lectures and assigned reading on How to Study, Definitions of Engineering, kinds of engineering, biographies, slide rule and problems. One hour lecture. One-half unit.

4. **Orientation.** Continuation of G. E. 3. One hour lecture.
Prerequisite: G. E. 3. One-half unit.

5. **Materials and Processes of Construction.** The manufacture, properties and uses of modern materials of engineering construction. Two hours lecture. Two units.

7. **Orientation.** Lectures and assigned reading on How to Study, Definitions of engineering, kinds of engineering, biographies, slide rule and problems. Two hours lecture One unit.

15. **Mechanics.** (Statics of Rigid Bodies). Resultants of force systems. Equilibrium of force systems. Graphical and algebraic solutions of forces acting on trusses and other structures. Friction. Three hours lecture.
Prerequisite: To accompany Math. 33. Three units.

16. **Mechanics.** (Strength of Materials). Physical properties of materials. Strength of machine and structural members. Deformation of machine and structural members under load. Four hours lecture.
Prerequisite: G. E. 15. To accompany Math. 34. Four units.

65. **Statics Laboratory.** Experimental study of forces, couples, and resultants of force systems. Centroids. Centers of pressure. Three hours laboratory.
Prerequisite: To accompany G. E. 15. One unit.

66. **Materials Laboratory.** Experimental study of the physical properties of engineering materials. Laboratory technique in accordance with A. S. T. M. testing methods. Three hours laboratory.
Prerequisite: To accompany G. E. 16. One unit.

105. **Management Engineering.** Industrial organization and management. Time and motion study. Wage systems. Cost accounting. Personnel work. Engineering economics. The financial structure. Public control of business. Taxation. The problem of investment. Valuation. Estimating. Engineering reports. Three hours lecture.
Prerequisite: Junior standing. Three units.

106. **Management Engineering.** Continuation of G. E. 105. Three hours lecture.
Prerequisite: G. E. 105. Three units.

108. **Seminar.** Reading and reports from current Engineering literature. Effective delivery of reports. One hour lecture and reports. Second semester.
Prerequisite: Senior standing. One unit.

115. **Mechanics.** (Dynamics of Rigid Bodies). Displacement. Velocity. Acceleration. Force. Mass. The work-energy relationship. The impulse-momentum relationship. Two hours lecture.
Prerequisite: G. E. 16. Two units.

116. **Mechanics.** (Mechanics of Fluids). Properties of Fluids. Fluid statics. Kinematics of Fluid Flow. The Energy Equation for Steady Flow. Dimensional Analysis. Flow of Fluids in Pipes. Momentum. Lift and Drag coefficients. Compressible Gas Dynamics. Open Channel flow. Hydraulic Machinery. Two hours lecture.
Prerequisite: G. E. 115. Two units.

121. Engineering Economics. Definition of economics. Basic concepts. Business units. Money and money systems. Investments. Labor relations. The economics of collectivism. Engineering economy studies. Present worth. Capitalized cost. Depreciation. Engineering reports and budgets. Contracts and specifications. Three lecture hours.
Three units.

122. Engineering Economics. Continuation of G. E. 121. Three hours lecture.
Prerequisite: G. E. 121. Three units.

126. Engineering Review. Review of the fundamental concepts and laws of mathematics and of the engineering sciences with practice in their application. Three hours lecture and computation. Second semester.
Prerequisite: Senior standing. One unit.

165. Dynamics Laboratory. Experimental study of moments of inertia, simple harmonic motion, gears and cams, relative motion, acceleration in rectilinear translation, rotation, and plane motion. Three hours laboratory.
Prerequisite: To accompany G. E. 115. One unit.

166. Fluids Laboratory. Experimental study of the pressure, flow and energy of fluids. Laboratory techniques in the use of orifice meters, Venturi meters, and other metering devices. Three hours laboratory.
Prerequisite: To accompany G. E. 116. One unit.

GEOLOGY

1. General Geology. A popular course of visual instruction to give the student an intelligent appreciation of the physiographic relief features of the earth and an insight into the probable conditions of the origin and formation of various geologic phenomena. Lectures, stereopticon projections, and supervised discussion. Two hours. Two units.

2. Historical Geology. Visual instruction regarding theories of earth formation. Paleontology. Special study of fossils with access to large museum. Lectures on geologic aspects of evolution. Two hours.
Two units.

33. Engineering Geology. A course in dynamical, structural and historical Geology. Particular attention is paid to structural Geology and the influences of constructive and engineering conditions. The student is made familiar with different stones by illustrating each recitation with specimens of the particular rocks treated, as well as their adaptability in construction, method of occurrence, etc. Ries and Watson: Engineering Geology. Two hours lecture. Two units.

34. Mineralogy. A course in Mineralogy with access to a large collection of specimens. Determination of unlabeled specimens. Crystallography. Blowpipe analysis. Includes a short course in Metallurgy. Iron ores and production of iron and steel. Percentage and effect of sulphur, silicon manganese and carbon in iron and steel. Coals, coke, carbons and ash. Two hours lecture.
Prerequisite: Geology 1. Two units.

101. Engineering Geology. The study of geology as it applies to the engineer in preliminary and exploration work for foundations of dams, bridges and buildings. Materials suitable for engineering structures. Erosion and silting of surface waters. Structural features of the earth's crust.

Laboratory work with the common minerals and rocks of concern to the engineer, also their identification. Two hours lecture, three hours laboratory. Three units.

GERMAN

1. **Elementary German.** Elements of German grammar. Drill in pronunciation. Vocabulary. Three hours. Fall semester. Three units.

2. **Elementary German.** A continuation of German 1. Syntax. Oral and written exercises. Reading from more simple German prose. Three hours. Spring semester. Three units.

3. **Intermediate German.** Review of syntax. Translation. Oral and written exercises. Reading of somewhat difficult German prose. Three hours. Fall semester.
Prerequisite: German 2. Three units.

4. **Intermediate German.** Reading, written and oral exercises. This course aims at preparing the student to read the more difficult German writers. Three hours. Spring semester.
Prerequisite: German 3. Three units.

5-6. **Advanced Composition and Reading.** Composition; sight reading; oral and written reports in German; conversation; historical survey of German literature. This course is conducted almost entirely in German. Three hours. Both semesters. Six units.

GREEK

1. **Elementary Greek.** The course is intended for those who enter without Greek. Grammar; simple prose selections; composition. Three hours. Fall semester. Three units.

2. **Elementary Greek.** A continuation of Greek 1. Readings from Xenophon: Anabasis, with prose composition based on Xenophon. Three hours. Spring semester. Three units.

3. **Intermediate Greek.** A continuation of the grammar, with readings and prose composition. Selected portions of the Iliad or Odyssey; Homeric Dialect; outline of Greek epic poetry. Three hours. Fall semester. Three units.

4. **Intermediate Greek.** A continuation of Greek 3, with special emphasis on sight reading and advanced prose composition. Three hours. Spring semester. Three units.

5. **Demosthenes.** A study of selected Olynthiac, Philippic orations or the speech on the Crown as models of oratorical art; analysis, discussion and criticism. Three hours. One semester. Three units.

6. **Homer and Sophocles.** A study of the Iliad and Odyssey of Homer; Oedipus Tyrannus of Sophocles. Three hours. One semester. Three units.

7. **A Study of Selected Greek Lyrics.** Three hours. One semester. Three units.

8. **Plato.** Readings from Plato. An analysis, discussion and criticism of his works. Three hours. One semester. Three units.

11. **Homer.** A study of the Greek Epic in the Iliad or Odyssey, with selected readings. Three hours. One semester. Three units.

12. **Sophocles.** Reading of the Oedipus Tyrannus or Antigone, with a study of Greek dramatic art and dramatic conventions. Three hours. One semester. Three units.

101. Historical Survey of Greek Literature. Special emphasis on its natural growth and reflection of Greek history. Influence on Latin and Modern Literature. Three hours. One semester. Three units.

102. Greek Historical Prose. Selections from Herodotus and Thucydides. Comparison of styles and critical spirit. Three hours. One semester. Three units.

103. Aeschylus and Sophocles. A tragedy of each with special emphasis on tragic structure and metric. Three hours. One semester. Three units.

104. Euripides and Aristophanes. One play of each (probably "Medea" and "Frogs"). Attention especially to Aristophanes' criticism of Euripides, and the relation of the two men to their times. Three hours. One semester. Three units.

105. Comparative Drama. A course supposing and supplementing Greek 103-104. Special study of the evolution of dialogue, chorus and dramatic character. Lectures on the Greek Theatre and its conventions. Two hours. One semester. Two units.

106. Lysias, Isocrates. Selected speeches. A study of the growth of Attic prose. Three hours. One semester.
Prerequisite: Greek 5. Three units.

107. St. John Chrysostrom, St. Basil. Selected orations with special reference to rhetorical style. Comparison with the Attic orators. Three hours. One semester. Three units.

110. Greek Style. Advanced composition involving exercises along essay and oratorical lines. Two hours. One semester. Two units.

HISTORY

Students who wish to make History their major subject, besides completing the other required courses of the lower division, must pass the courses in History 2A and 2B or 4A and 4B and Political Science 1-2 with at least a grade of C.

The major program must include 18 units of upper division work in History, with an additional 6 units which may be taken in a related field approved by the department. An average grade of C must be maintained in all courses of the major and, at the end of the senior year, each student must pass a comprehensive final examination.

1A-1B. Survey of Western Civilization. A background course sketching in broad outline the principal historical factors forming our European culture. Required readings. Three hours. Two semesters. Two units.

2A-2B. History of Western Civilization. A general survey of western culture from its beginnings to the present, emphasizing those institutions which have shaped our modern civilization. Three hours. Two semesters. Six units.

4A-4B. (1-2)* History of Modern Europe. A survey of European developments from the fifteenth century to the present. The emergence of national states. The French and Industrial Revolutions and their im-

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* Bracketed numbers refer to catalogue 1945-46.

pact upon European life. The two world wars and their aftermath. Three hours. Two semesters. Six units.

111A-111B. (100-110)* **Ancient History.** The ancient civilizations of the near east. Greek history to the Roman conquest. The history of Rome from its beginning to Constantine. Three hours. Two semesters. Six units.

121. **Medieval History.** A general survey of the Middle Ages from the fourth to the fifteenth century. Three hours. One semester. Three units.

131A. **The Renaissance and Reformation.** A critical study of the revival of the old and the birth of new learning. The Protestant Revolt and the Catholic Counter Reformation. Three hours. One semester. Three units

131B. **The Seventeenth and Eighteenth Centuries.** The rise of absolute monarchs. The struggle for European preeminence and world empire. The Benevolent Despots. Three hours. One semster. Three units.

145. (104)* **The Nineteenth Century.** A study of the revolutionary movements in Europe stemming from the French and Industrial Revolutions. The rise of the middle classes and the struggle for liberal constitutional government. Underlying social unrest. Three hours. One semester. Three units.

146. (107)* **The Twentieth Century.** The intensification of national and imperial rivalries in Europe, culminating in universal wars. Social upheavals and their effects. Attempts at world organization to enforce peace. Three hours. One semester. Three units.

151. **History of England.** The growth of the English state and Constitution. Expansion of British power. Britain's role in European and world conflict. Political and social developments with special emphasis on the modern period. Three hours. One semester. Three units.

155. **The British Commonwealth and Empire.** The first mercantile empire in America and the Indies. The later empire after 1783. The rise of the free dominions. Imperial problems in India, the near east and Africa. Three hours. One semester. Three units.

161A-161B. (131-132)* **History of the Americas.** The aboriginal world. The course of exploration and conquest. The colonial systems. The revolutions in North and South America. Organization of the new self-governing nations. Inter-American relations. The Monroe Doctrine, Pan-Americanism and the Good Neighbor Policy. Three hours. Two semesters. Six units.

171A-171B. (105-106)* **History of the United States.** A general course sketching the chief factors in our national development. Colonial beginnings. The Revolution. The Constitution. Political history of the United States. Three hours. Two semesters. Six units.

198. **Individual Conferences and Assignments.** Required for all seniors, whose major is history, during the second semester. Assigned reading and direction in research for the senior thesis.

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ITALIAN

1. **Elementary Italian.** Elements of Italian Grammar. Drill in Pronunciation. Vocabulary. Three hours. Fall semester. Three units.

2. **Elementary Italian.** A continuation of Italian 1. Syntax; oral and written exercises. Reading from simpler Italian prose. Three hours. Spring semester. Three units.

3. **Intermediate Italian.** Review of grammar and syntax. Translation. Oral and written exercises. Reading of somewhat difficult Italian prose. Three hours. Fall semester.
Prerequisite: Italian 2. Three units.

4. **Intermediate Italian.** Reading, written and oral exercises. This course aims at preparing the student to read the more difficult Italian writers. Three hours. Spring semester.
Prerequisite: Italian 3. Three units.

5-6. **Italian Literature.** A study of special periods and writers in Italian literature with emphasis on their literary qualities. The development of fluency in Italian composition and pronunciation. An easy reading, writing and conversational knowledge of Italian is presumed. Three hours. Both semesters.
Prerequisite: Italian 4. Six units.

LATIN

A-B. **Elementary Latin.** Beginning Latin courses for students who have had no previous study in Latin. These courses are equivalent to the first two years of high school Latin. Three hours. Each semester. Six units.

C-D. **Intermediate Latin.** Courses equivalent to the last two years of high school Latin. Three hours. Each semester. Six units.
Pre-requisite: Two years of high school Latin or Latin B.

1. **Cicero.** The orations studied as methods of oratorical art; rapid reading, analysis. discussion, criticism. Latin composition based on special text and matter read in class. Three hours. Fall semester.
Prerequisite: High School Latin: 4 years. Three units.

2. **The Epic—The Aeneid.** After reading books VII-XII, the poem will be studied as a whole, special attention being given to the sources, to the epic technique and literary art of Virgil and to the tracing of his influence in the literature of the world. Narration and descriptive composition based chiefly on the text of the Aeneid and implying a discrimination of the vocabulary and syntax of prose and verse. Students will write three compositions weekly. Three hours. Spring semester.
Prerequisite: Latin 1. Three units.

3. **The Latin Historians.** Copious reading in Sallust, Curtius, Pliny and Livy, with critical consideration of the historical works of these writers, and collateral reading directed to reach an appreciation of their place in Latin literature. Latin composition based on the Latin historians. Three hours. Fall semester.
Prerequisite: Latin 2. Three units.

4. **The Lyric and Elegiac Poets.** The Odes of Horace, books I-IV, with selections from the "Ars Poetica," and the elegies of Ovid and Propertius, will be read and carefully studied. Such phases of Roman life as

are suggested will be the subject of collateral reading under the direction of the professor. Latin composition. Students will be expected to show facility and elegance of diction in their written work. Three hours. Spring semester.

Prerequisite: Latin 3. Three units.

6. **Cicero as an Essayist.** Cicero's charm as an essayist; discussion of the several types of his essays; reading of **De Amicitia, De Senectute,** and parts of **De Natura Deorum.** Three hours. One semester. Three units.

7. **Special Latin.** A rapid review of elementary Latin, including grammar, composition and rapid reading of easy passages. Intended for students with an amount of High School Latin insufficient to enter Latin 1. Three hours. Both semesters.

Prerequisite: High School Latin, 2 years. Six units.

11. **The Odes and Epodes of Horace.** Selections including the greater part of Horace's lyrical works, studied with relation to their background, literary art and metrical form. Three hours. One semester. Three units.

12. **The Elegiac Poets.** Selections and studies in Ovid, Propertius and Tibullus. Origin and development of the elegiac form. Three hours. One semester. Three units.

101. **The Drama.** A critical study of the Latin dramatists: Seneca, Plautus, Terence. Three hours. One semester. Three units.

102. **Historical Survey of Latin Literature.** Special emphasis on its influence upon Modern Literature. Three hours. One semester. Three units.

103. **Tacitus.** A study of the qualities of the style of Tacitus with some consideration of his characteristics as an historian. Two hours. One semester. Two units.

104. **Virgil.** The earlier works, particularly the Eclogues and Georgics. Consideration of the character of Virgil through his ideas and aims. Two hours. One semester. Two units.

105. **Christian Poetry.** From its beginnings to the fourteenth century. Two hours. One semester. Two units.

106. **Patristic Latin.** A study of the variations from the Latin of the Augustan and Silver Ages as shown in the Fathers of the Church. Two hours. One semester. Two units.

107. **Horace's Satires and Epistles.** Characteristics of the Roman Satire, Horace's philosophy of life and of literature. Two hours. One semester. Two units.

108. **Cicero. The Tusculan Disputations and Somnium.** Reading of the entire work, with attention to the style of Cicero as a didactic writer and to his philosophy. Two hours. One semester. Two units.

109. **Quintilian. Institutio Oratoria.** Quintilian as teacher and rhetorician. Two hours. One semester. Two units.

110. **Seneca.** Selections from the essays and epistles; Seneca the moralist compared with Cicero. Seneca's style. Two hours. One semester. Two units.

111. **Pliny The Younger.** Selection from the letters as groundwork for the study of Roman life under Nerva and Trajan. Two hours. One semester. Two units.

112. **Medieval Latin.** The Latin of the Middle Ages in relation to the Classical and to the formation of the modern Romanic languages. Lectures and readings. Two hours. One semester. Two units.

113. **Latin Style.** Advanced composition in the essay and oratorical styles. Analysis of the periodic structure and amplification. The chria and 'declamatio'. Work to be done under the direction of the professor. Two hours. Two semesters. Four units.

114. **Latin Verse Composition.** Prosody and verse forms. Original compositions in lyric, distich and hexameter verses. Work to be done under the direction of the professor. Two hours. One semester. Two units.

115. **Latin Conversation.** Instruction in the technique of Latin conversation. Opportunity will be given to select groups for daily practice in oral composition. Examinations are conducted orally. Two hours for four semesters. One unit per semester.

LAW

1. **Contracts.** Elements of a contract; parties; consideration; illegal and void contracts; construction; verbal and written contracts; Statute of Frauds; termination; breach; damages. Two hours lecture. Two units.

2. **Agency and Sales.** Who may be agents and how appointed; rights and duties of agents and principals in reference to each other and to third parties; termination. **Sales:** the contract of sale; immediate and future sales; rights and duties of consignee, consignor and carrier; stoppage and loss in transit; setting aside sales; warranties. Two hours lecture. Two units.

3. **Negotiable Instruments, Bailments and Carriers, Property;** Bills, notes, drafts and checks; acceptance of drafts; certified checks; rights and liabilities of endorsers; presentment; notice of dishonor; protest. **Bailments:** nature and classification; innkeepers. Common carriers, carriers and passengers; of goods; telegraph and telephone companies. Three hours lecture. Three units.

4. **Partnerships and Corporations, Bankruptcy:** Articles of copartnership; rights of partners against each other; rights of creditors against firm and partners; kind of partners; termination, liquidation of assets. Corporations; charter and by-laws; stockholders' and directors' meetings; forms of corporate stock; elections; ultra vires acts; directors' and stockholders' liabilities; rights of creditors; dissolution. **Bankruptcy:** Who may become bankrupt; exemptions; duties; compositions; discharge; offenses against bankruptcy law; trustees and referees; preferred creditors. Three hours lecture. Three units.

91. **Business Law.** A brief course in Contracts, Sales, Negotiable Instruments, Real Estate, Partnership, Corporations and such other subjects as may be selected. This course is designed for students in the College of Engineering. One hour lecture. Spring semester. One unit.

101. **Introduction to Law.** The development of the common law in England and the United States. Spirit of the common law, the nature of

judicial process, the doctrine of stare decisis and its proper application. The reasons for the case method in the study of law, the proper use of case books. One hour lecture. One semester. One unit.

Professional Courses — First Year

104. **Legal Research.** Law Books and Their Use. One unit.

105. **Contracts 1.** Offer and acceptance, consideration, assignments, joint contracts, joint and several contracts, conditions, third party beneficiary, breach. Six units.

106. **Criminal Law and Procedure.** Jurisdiction, procedure, elements of criminal liability, various crimes, criminal intent, malice. Three units.

109. **Property 1.** Ownership, legal title, possession, fixtures, emblements, bailments, carriers. Three units.

111. **Agency.** Nature of agency relations, distinguished from other relations, rights of third person against principal, against agent, rights and duties of principal and agent inter se, liability of principal for acts of agents in contract, in tort, liability of principal for acts of independent contractors. Three units.

112. **Torts.** Negligence, intentional harms, libel and slander, causation, contributary negligence, last clear chance doctrine.
Three hours. Two semesters. Six units.

113. **Equity I.** Origin and nature of equity jurisdiction, jurisdiction in personam and in rem, extra-territorial effects of equity decrees, specific reparation for torts and specific performance of contracts. Three units.

Second and Third Years

203. **California Practice.** Jurisdiction of California courts, Venue; Summons; Statute of Limitations; Trial Procedure; Dismissal or Nonsuit; Directed Verdict; The Verdict; Judgments; Motion for New Trial; Writs. Three units.

204. **Code Procedure.** Nature of the Civil Action under the Code: Parties to the Action; The Complaint; Demurrer of the Complaint; The Answer; The Cross-Complaint; The Reply; Demurrer to Pleadings subsequent to the Complaint. Two units.

206. **Conflicts of Law.** Status, nature of domicile, real property rights, rights in personality. Three units.

207. **Constitutional Law.** Equal protection of law, due process of law, impairment of contract, separation of powers, theories of constitutional interpretation, full faith and credit clause, interstate commerce, states' rights. Five units.

210. **Equity II.** Injunctive relief, nature of so-called equitable defenses, bills of interpleader, bills to quiet title, mutuality of performance and mutuality of remedy distinguished, equitable servitudes. Three units.

211. **Evidence.** Questions of law and fact, burden of proof, witnesses, hearsay rule, documentary original rule, res gestae, admissions, confessions, opinion rule so-called, rationalization of rules of evidence. Five units.

215. **Negotiable Instruments.** Promissory notes, bills of exchange, Uniform Negotiable Instrument Law. Three units.

217. **Corporations and Partnerships.** Corporate Entity; De Facto Corporations; Rights of Stockholders; relation of Director to Corpora-

tion; Limitations upon power of Directors; Corporate Stock; Bonds; By-Laws; Nature of Partnership relation; Rights and Obligations as to Third Parties; Rights and Obligations inter se; Creation, Management and Dissolution. Five units.

218. **Property II.** Real property, covenants running with the land, title, adverse possession, future interests. Six units.

219. **Sales.** Uniform Sales Act. Three units.

220. **Trusts.** The Nature, Creation and Elements of a Trust; The transfer of a Beneficiary's Interest, consideration of Spendthrift Trusts; The Administration of Trusts; The Termination and Modification of Trusts; Charitable Trusts; Resulting and Constructive Trusts. Three units.

222. **Wills and Administration.** Probate, distribution of estate, requirements for valid will, execution, revocation, and alteration of will, distinction between various types of legacies. Three units.

224. **Suretyship and Mortgages.** Surety relation, mortgagor and mortgagee. Two units.

225. **Domestic Relations and Community Property.** Marriage Annulment, divorce, marital property. Three units.

226. **Contracts II.** Excuses for non-performance, impossibility, mistake, illegality, damages for breach of contract, remedies for breach, recission, specific performance, restitution, quasi-contracts. Two units.

227. **Taxation I.** Power to tax, taxation of persons and property, inheritance tax, State and Federal tax, remedies. Three units.

228. **Special Study.** This course is a rapid review of fundamental law courses with written exercises. This course is open only to graduates of this college.

229. **Taxation II.** Federal Income Tax. Two units.

In addition to the above courses, a course in accountancy will be required of all students registered in the College of Law. This course has been specifically designed to meet the needs of the law student in view of the accounting problems he may reasonably expect to encounter in the subsequent practice of law.

Econ. 30 A-B. Survey of Accounting. This course is designed to meet the needs of students whose major interest is the practice of law. To that end the phases of accounting treated are those which involve a consideration of partnerships, corporations, ventures, syndicates, estates, trusts, and the problems involving asset valuation in public utility rate making cases. Four units.

All students taking Law are required to attend without credit all sessions of the Moot Court and all special lectures given during the scholastic year.

MATHEMATICS

1. **Algebra.** Review of the fundamental operations; exponents; linear and quadratic equations; logarithms; progressions; the binomial theorem. Three hours. One semester. Three units.

2. **Trigonometry.** The generalized definitions of the trigonometric functions for any angle; inverse functions; functions of the sum and difference of two angles; of multiple angles; of half angles; trigonometric

identities and equations; graphs of the trigonometric functions; solution of right and oblique triangles. Three hours. One semester.
Prerequisite: Math. 1. Three units.

6. **Analytic Geometry.** Loci and their relations; graphs of functions; transformation of coordinates; the straight line; the conic sections; polar coordinates; parametric equations. Three hours. One semester.
Prerequisite: Math 2. Three units.

7. **Calculus.** Fundamental concepts of variables, functions, limits, derivatives and differentials; differentiation of the elementary algebraic and transcendental functions; application to maxima and minima; successive differentiation and its application to curve plotting; the derivative as a rate change. Three hours. One semester.
Prerequisite: Math. 6. Three units.

8. **Calculus.** The fundamental concepts of the anti-derivative and the definite integral defined as the limit of a sum; geometric applications to lengths, areas, surfaces and volumes; applications to Physics and Mechanics. Three hours. One semester.
Prerequisite: Math. 7. Three units.

9. **Calculus.** Space geometry; multiple integration; partial differentiation; theorem of the mean; Taylor's series; evaluation of indeterminate forms. Three hours. One semester.
Prerequisite: Math. 8. Three units.

10A - 10B. **Fundamental Principles and Methods of Mathematics.** This course is designed to meet the needs of those students who have little need for technical skill in mathematics. Comprehension of principles rather than techniques of manipulation is emphasized. The subject matter includes the nature of deductive logic; mathematics as a deductive science; a logical treatment of the number system, algebra, and selected branches of mathematics; introduction to analytic geometry and calculus. Three hours lecture. Two semesters. Six units.

15. **Introduction to Mathematical Analysis.** A study of the scientific method of mathematical analysis designed particularly to meet the needs of students of the College of Business Administration. Three hours lecture. One semester. Three units.

16. **Plane Trigonometry and Mathematical Analysis.** An intensive survey of plane trigonometry and the concepts and mathematical tools which form the basis for statistics and mathematics of finance. Three hours lecture. One semester. Three units.

24. **Calculus.** Fundamental formulae and principles for differential and integral calculus; maxima and minima; curvature; surfaces; volumes; intermediate forms; envelopes; series; expansion; forms of integration; practical applications. Four hours. One semester.
Prerequisite: Math. 18. Four units.

25. **Calculus.** Continuation of Math. 24. Four hours. One semester. Four units.

*31. **Introductory Analysis.** Coordinate systems. Graphs. Functions. Systems of linear equations. Quadratic equations. Polar coordinates and the trigonometric functions. The straight line. Loci. The conic sections. Four hours lecture, one hour review. Fall semester. Four units.

*32. **Introductory Analysis.** Transformation of coordinates. Oblique triangles. Exponents. Logarithms. Complex numbers. The derivative and its applications. Theory of equations. Empirical equations. Solid analytic geometry. Four hours lecture, one hour review. Spring semester.
Prerequisite: Mathematics 31. Four units.

*33. **Calculus.** Engineering applications of the derivative. The indefinite integral. The definite integral. Numerical integration. Applications of the definite integral. First semester. Four hours lecture, one hour review.
Prerequisite: Math. 32. Four units.

*34. **Calculus.** Partial differentiation. Multiple integration. Engineering applications of the multiple integral: centroids, moments of inertia, work, fluid pressure. Series. Expansion of functions. Ordinary differential equations. Second semester. Four hours lecture, one hour review.
Prerequisite: Math. 33. Four units.

41. **Analytic Geometry.** Review of intermediate algebra and plane trigonometry. Plane analytic geometry. An introduction to solid analytic geometry. Four hours lecture, one hour review. Four units.
Prerequisite: Two years high school algebra, one half year plane trigonometry or Mathematics 1 and 2.

42. **Differential Calculus.** Basic concepts of variables, function, limits. Derivatives, differentials, and their applications. Parametric equations, polar equations and roots. Theorem of the Mean and its applications.
Prerequisite: Mathematics 41. Three units.

43. **Integral Calculus.** Integration of elementary forms; the definite integral. Integration as a process of summation. Formal integration by various devices. Centroids, fluid pressure, and other applications. Three hours lecture.
Prerequisite: Mathematics 42. Three units.

44. **Integral Calculus.** Expansion of functions. Applications of partial differentiation and multiple integrals. Three hours lecture.
Prerequisite: Mathematics 43. Three units.

116. **Differential Equations.** Analysis and deduction of formulae and equations used in Physics, Mechanics and engineering problems; applications of formulae and equations given in engineering problems; aplications of formulae and equations given in engineering handbooks to problems; practical problems and lectures. Two hours. One semester.
Prerequisite: Math. 34. Two units.

121. **Differential Equations.** Ordinary differential equations and their application. Hyperbolic function. Three hours lecture.
Prerequisite: Mathematics 44. Three units.

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*Note: One period each week in Mathematics 31, 32, 33, and 34 is devoted to review and discussion for which the student is not required to prepare an assignment or home work.

122. **Advanced Calculus.** Elliptic integrals. Infinite series. Fourier series, Bessel functions, and their applications. Three hours lecture.
Prerequisite: Mathematics 121. Three units.

MECHANICAL ENGINEERING

11. **Shopwork.** Manufacturing processes. Machine tools. Arc and oxy-acetylene welding. Foundry. Electric wiring. Molding of plastics. Economic and scientific fabrication of parts. These processes are all performed by students and this experience is supplemented by visits to commercial shops and by moving pictures showing manufacturing processes. Three hours lecture, shop work and inspection trips. One unit.

12. **Shopwork.** A continuation of M. E. 11. Three hours lecture, shop work and inspection trips.
Prerequisite: M. E. 11. One unit.

15. **Mechanical Engineering Laboratory.** Experimental study of such measuring devices as tachometers, pyrometers, dynamometers, calorimeters, and planimeters. Experimental measurement of such engineering values as the heating value of fuels and efficiency of engines by using these devices. One hour lecture and three hours laboratory.
Prerequisite: To accompany Physics 14 and 15. Two units.

16. **Machine Drawing.** Freehand sketches and working drawings of machine parts and assemblies. Jigs and fixtures. Working drawings for welded construction. Working drawings for electrical work. Three hours drafting.
Prerequisite: G. E. 2. One unit.

116. **Airplane Structures.** Structural analysis and design of airplanes. Commerce regulation for airworthiness. Three hours lecture.
Three units.

125. **Heat Power.** Energy concepts. The general Energy Equation. Characteristics of gases. Enthalpy. Entropy. Reversibility. Properties of vapors and gases. Cycles for internal combustion engines. Compression and expansion of gases. Combustion and the products of combustion. Variable specific heats. Vapor processes. Vapor cycles. Steam engines. Steam generators. Steam power plant cycles. Flow of gases and vapors through nozzles. Steam turbines. Refrigeration. Air conditioning. Heat transfer. The economic problem. Load curves. Selection of type of plant. Energy rates. Three hours lecture.
Prerequisite: Physics 14 and 15. Three units.

126. **Heat Power.** Continuation of M. E. 125. Three hours lecture.
Prerequisite: M. E. 125. Three units.

127. **Heat Power.** An introduction to the basic laws of conduction, convection and radiation. Application of these laws. Two hours lecture.
Prerequisite: M. E. 126. Two units.

128. **Heat Power.** Continuation of M. E. 127. Two hours lecture.
Prerequisite: M. E. 127. Two units.

130. **Heat Power.** Sources of energy. Combustion Conversion of heat energy into mechanical energy. The Otto cycle. The Diesel cycle. The steam boiler. The steam engine. The steam turbine. Pumps. For civil engineering students. Three hours lecture.
Prerequisite: Physics 14 and 15. Three units.

131. Heating, Ventilation and Air Conditioning. Fundamental laws and principles governing the heating, ventilation and air conditioning of such structures as buildings, tunnels and subways and airplanes. Heating, ventilation and air conditioning apparatus. Three hours lecture.
Prerequisite: M. E. 126. Three units.

132. Heating, Ventilation and Air Conditioning. Continuation of M. E. 131. Three hours lecture.
Prerequisite: M. E. 131. Two units.

133. Aerodynamics. Principles of fluid mechanics applied to airplane structures. Airfoil action, propellers, models and stability. Two hours lecture.
Prerequisite: Senior standing. Two units.

134. Airplane Structures. Structural analysis and design of airplanes. Commerce regulation for airworthiness. Two hours lecture.
Prerequisite: M. E. 133. Two units.

135. Internal Combustion Engines. The internal combustion engine process. Fuels and fuel-air mixtures. Thermodynamics of internal combustion engine cycles. The Otto and Diesel cycles and various modifications of these cycles. Engines operating on these cycles. Testing and performance. Jet engines and gas turbines. Three hours lecture.
Prerequisite: M. E. 126. Three units.

136. Internal Combustion Engines. Continuation of M. E. 135. Two hours lecture.
Prerequisite: M. E. 135. Two units.

137. Time Study and Job Analysis. Measurement of labor. Operation analysis. Motion study. Process charts. Laws of motion economy. Micromotion study. Film analysis procedure. Standardizing the job. Skill. Effort. Formula expression. Formula working sheets. Two hours lecture.
Prerequisite: To accompany G. E. 121. Two units.

138. Production Control. The problem of the production of goods. Factors which aid modern productivity. Coordination of sales and manufacturing. Organization for production control. Research. Budgets. Materials. Machine replacement. Methods and standards. Planning and routing. Operation and instruction sheets. Centralized control of production. Inspection. Measures of factory performance. Three hours lecture.
Prerequisite: G. E. 121. Three units.

139. Mechanical Vibrations. The analysis of mechanical vibrations. Vibration damping and isolation. Critical speeds of shafts. Behavior of structures subjected to dynamic loading. One hour lecture.
Prerequisite: G. E. 115 and 165. One unit.

146. Physical Metallurgy. A study of Phase equilibria, the fundamental structure of metals and alloys, the transformations in steel, the functions of alloying elements in steel, grain size and grain growth, hardening, and heat treatment. Two hours lecture.
Prerequisite: Senior standing in Mechanical Engineering. Two units.

169. Thesis. Investigation of some engineering problem and the writing of an acceptable thesis. Conferences as required.
Prerequisite: Senior standing in Mechanical Engineering.
One unit.

170. **Thesis.** Continuation of M. E. 169.
Prerequisite: M. E. 169. One unit.

175. **Mechanical Engineering Laboratory.** Experimental study of the flow of liquids and gases through pipes. Experimental study of the flow of heat through various media. Tests of such machines as diesel engines, automotive engines, steam engines, steam boilers, steam turbines, condensers, and pumps by the use of the procedures specified in the A.S.M.E. Test Codes. Three hours laboratory.
Prerequisite: M. E. 15. One unit.

176. **Mechanical Engineering Laboratory.** Continuation of M. E. 175. Three hours laboratory.
Prerequisite: M. E. 175. One unit.

177. **Mechanical Engineering Laboratory.** Continuation of M. E. 176. Three hours laboratory.
Prerequisite: M. E. 176. One unit.

178. **Mechanical Engineering Laboratory.** Continuation of M. E. 177. Three hours laboratory.
Prerequisite: M. E. 177. One unit.

180. **Mechanical Engineering Laboratory.** Experimental study of simple measuring devices and their application in the determination of such quantities as power of engines and motors, heating value of fuels and efficiencies of prime movers. For civil engineering students. Three hours laboratory.
Prerequisite: To accompany M. E. 130. One unit.

181. **Heating, Ventilation, and Air Conditioning Laboratory.** Experimental study of heating and refrigeration equipment. The control of temperature and humidity. The operation of fans. Three hours laboratory.
Prerequisite: To accompany M. E. 131. One unit.

182. **Heating, Ventilation, and Air Conditioning Laboratory.** Continuation of M. E. 181. Three hours laboratory.
Prerequisite: M. E. 181. One unit.

183. **Aerodynamics Laboratory.** Wind tunnel tests to measure airfoil action and stability. Three hours laboratory.
Prerequisite: To accompany M. E. 133. One unit.

184. **Airplane Laboratory.** Tests of the strength of struts and frames used in airplane wings, hulls, engine nacelles and landing gears. Three hours laboratory.
Prerequisite: To accompany M. E. 134. One unit.

185. **Internal Combustion Engine Laboratory.** Experimental study of combustion. Effects of increased compression, preheating, supercharging and shape of combustion space. Efficiency tests of internal combustion engines. Three hours laboratory.
Prerequisite: To accompany M. E. 135. One unit.

186. **Internal Combustion Engine Laboratory.** Continuation of M. E. 185. Three hours laboratory.
Prerequisite: To accompany M. E. 136. One unit.

187. **Time Study Laboratory.** Stop watch and camera studies of various jobs. Development of the one best way to perform a job. Devel-

opment of the time standard for a job. Six hours laboratory.
Prerequisite: To accompany M. E. 137. Two units.

188. Production Laboratory. Scheduling and job instruction applied to work in the University shops and laundry. Visits to manufacturing plants. Three hours laboratory.
Prerequisite: To accompany M. E. 138. One unit.

189. Vibration Laboratory. Vibrations of spring and weight without damping. Torsional vibration. Beam and weight. Damped vibrations. Equivalent systems. Mechanical and electrical models of vibration systems. Three hours laboratory.
Prerequisite: To accompany M. E. 139. One unit.

191. Machine Design—Kinematics. A study of Motions, Velocities and Accelerations in Linkages, Cams, Gears, and Miscellaneous Mechanisms and acceleration, normal, tangential, and other forces transmitted by these mechanisms. One hour lecture. Three hours Drafting.
Two units.

192. Machine Design. Principles of Kinematics, Mechanics, Properties of Materials and Manufacturing Processes Applied to Design of Machine Elements. One hour lecture. Three hours computation and drafting.
Prerequisite: M. E. 16, G. E. 16, and M. E. 191. Two units.

193. Machine Design. Continuation of M. E. 192 and Application of Principles to Design of Machines. Six hours lecture, computation and drafting.
Prerequisite: M. E. 192. Two units.

194. Power Plant Design. Principles of engineering economy applied to the selection of power plant sites and equipment. Layout of a complete power plant. Five hours lecture, computation and drafting.
Prerequisite: M. E. 126. Three units.

196. Metallurgy, Laboratory. Pyrometry, Thermal Analysis, preparation of metallographic specimens, photomicrography, macroscopy, heat treatment, carburizing grain size, and hardenability. Three hours laboratory.
Prerequisite: Senior standing in Mechanical Engineering. One unit.

MILITARY SCIENCE AND TACTICS

Basic Course

(Subjects common to all Branches of Service)

1-2. First Year. Introduction to military science. Leadership, drill, and exercise of command. Two hours lecture, one hour drill. Two semesters. Three units.

3-4. Second Year. Introduction to branch technique. Leadership, drill, and exercise of command. Two hours lecture, one hour drill. Two semesters. Three units.

Advanced Course

101-102. First Year. Branch tactics and technique. Leadership, drill, and exercise of command. Four hours lecture, one hour drill. Two semesters. Eight units.

103-104. Second Year. Military administration and personnel management. Military teaching methods. Psychological warfare. Branch tactics and technique. Leadership, drill, and exercise of command. Four hours lecture, one hour drill. Two semesters. Eight units.

Summer Training Camp

Subjects Common to all Branches (130 hours). Military sanitation; chemical warfare; safeguarding military information; drills, parades, ceremonies; weapons and marksmanship; information and education; interior guard duty; organization supply, records and methods; mess management; mines, booby traps, and demolitions; physical training and athletics; marches and bivouacs.

Artillery (110 hours). Maps and aerial photos; terrain appreciation; Field Artillery organization; signal communication; motor movements and maintenance; field fortifications, pioneering, and camouflage; firing battery; fire direction center; military arithmetic; observed fires; unobserved fires, field exercises, RSOPs and service practice. Camp is of six weeks duration and attendance required upon completion of First Year Advanced course.

PHILOSOPHY

Students who wish to make Philosophy their major subject, besides completing the other required courses of the lower division, must pass the courses in Philosophy 41A - 41B with at least a grade of C.

The major program must include 24 units of upper division courses in Philosophy. An average grade of C or higher must be maintained in all courses of the major and, at the end of the senior year, each student must pass a comprehensive final examination.

A minor, including 12 upper division hours and the lower division prerequisites, must be chosen by each student making Philosophy his major.

9. Logic. An introductory course in the science of correct thinking, comprising both formal, traditional, or deductive logic together with inductive inference and scientific method, with special stress on the structures of the syllogism and the detection of fallacies. Exercises in the construction and criticism of arguments. Three hours. One semester. Three units.

21. (13)* Philosophy of Nature. Beginning with a brief introduction to philosophy, this course investigates the chief problems of cosmology and seeks a rational interpretation of the physical universe, both of the inorganic world and of the organic world exclusive of conscious phenomena. Matter, energy, quantity, motion, space, time. Life in general, its nature, origin, and development. Mechanism and teleology. Three hours. One semester. Three units.

22. (14)* Philosophy of Mind. Rational psychology from the philosophical standpoint. This course seeks a philosophy of man, the phenomena and source of man's conscious life. Intellect and its chief operations, the origin of ideas. Will and its motivation, free will and determinism. The nature, origin, and destiny of the human soul. The relation between the psychic and physical parts of man. Three hours. One semester. Three units.

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*Bracketed numbers refer to catalogue 1948-49.

41A, 41B. (5-6)* History of Philosophy. A comprehensive survey of the whole history of philosophy, ancient, medieval and modern. Lectures, essays and supplementary readings. Three hours. Both semesters. Six units.

61. (35)* Logic and Natural Philosophy. This, together with Philosophy 62, 63 and 64, forms a compendious course designed for engineering students. It begins with a brief survey of logic, relating deduction and mathematics, induction and scientific method. It continues with the cosmological problem: the philosophical interpretation of the physical universe. Three hours. One semester. One and one-half units.

62. (36)* Philosophy of Living Beings. A study of life in general, beginning with merely organic life and ending with the intellectual life of man. Stress is placed on the study of man, the relations between his mind and body, his chief mental operations and their ultimate principle, the nature, origin, and destiny of the human soul. Three hours. One semester. One and one-half units.

63. (37)* Metaphysics. The problem of the validity of human knowledge: truth, error, doubt and certitude. The problem of reality: being and becoming, substance and causality. The problem of the ultimate cause of all reality: God. His existence and attributes. Three hours. One semester. One and one-half units.

64. (38)* Ethics. General principles: the good life, right and wrong, the moral act, natural law, conscience, rights and duties. Application of the principles to man's individual and social life: man's personal, marital, proprietary, industrial, political, and international rights and obligations. Three hours. One semester. One and one-half units.

105. Ancient Philosophy. A study of the development of Greek thought from the pre-Socratic era, through Plato and Aristotle, to the end of the Greco-Oriental period. Lectures, essays, and required readings. Three hours. One semester. Three units.

106. Medieval Philosophy. A study of the development of philosophy from the Patristic age to the Renaissance, with stress on the Scholastic philosophy of the twelfth and thirteenth centuries. Its decline and modern revival. Lectures, essays, and required readings. Three hours. One semester. Three units.

107. Modern Philosophy. The philosophy of the Seventeenth and Eighteenth Centuries, from Descartes up to but not including Kant. The parallel progress of the Intellectualist and Empiricist movements. Lectures, essays, and required readings. Three hours. One semester. Three units.

108. Recent Philosophy. The philosophy of the Nineteenth and Twentieth Centuries: Kant to the present day. A rather thorough study of German Idealism: Kant and his successors. Positivism, evolutionism, pragamatism, neo-realism, and the main currents of recent speculation. Lectures, essays, and required readings. Three hours. One semester. Three units.

109. Theory of Knowledge. The main problems of epistemology and ontology: a study of first principles, both of knowledge and of reality. The critical problem: the trustworthiness of human knowledge; skepticism, idealism, realism, empiricism, rationalism, positivism, pragmatism,

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*Bracketed numbers refer to catalogue 1948-49.

relativism. The possibility, nature, extent, and criteria of certitude. The ontological problem: being and becoming, substance and causality. Three hours. One semester. Three units.

110. **Metaphysics.** A study of the absolutely ultimate in reality. Theism, atheism, agnosticism, deism, naturalism, pantheism examined from the purely philosophical standpoint. God in the philosophies of Plato, Aristotle, Augustine, Aquinas, Descartes, Spinoza, Leibniz, Hume, Kant, and others. Critical examination of the arguments for God's existence and attributes. Providence and the problem of evil. Three hours. One semester. Three units.

121. **Advanced Logic.** An advanced course in the field of logic, with systematic reference to its metaphysical and epistemological principles. Open only to philosophy majors. Three hours. One semester. Three units.

122. **Advanced Metaphysics.** An intensive study of the questions and problems concerning mind and reality, with special reference to modern and recent metaphysical theory. Three hours. One semester. Three units.

151. (103)* **Fundamental Ethics.** The general theory of ethics: the aim of human life, the nature of the moral act, the norm of morality, natural and positive law, conscience, right and duty. Examination of hedonism, altruism, utilitarianism, moral sensism, moral positivism, moral rationalism, moral evolutionism, and other systems. Three hours. One semester. Three units.

152. (104)* **Applied Ethics.** The application of general ethical principles to definite human rights and duties. Individual ethics: the right to life, honor, and property. Social ethics: domestic society, marriage and the family; industrial society, capital and labor, industrial disputes; civil society, the state and its origin, nature, forms, rights, and functions. International ethics: the right of nations, international law, peace and war. Three hours. One semester. Three units.

PHYSICS

1. **Mechanics, Molecular Physics, Sound.** General principles of matter. General properties of bodies. Equilibrium. Gravity. Pendulum. Properties peculiar to solids. Capillarity. Hydro-dynamics. The properties of gases. Aerodynamics. Production, propagation and reflection of sound. The physical theory of music. Three hours lecture. Fall semester. Three units.

2. **Physical Laboratory.** To accompany Physics 1. Three hours laboratory. Fall semester. One unit.

3. **Light, Heat, Electricity.** Transmission, velocity and reflection of light. Mirrors. Lenses. Dispersion and achromatism. Optical instruments. The eye. Double refraction. Interference and polarization. Properties of magnetism. Laws of magnetic action. Terrestrial magnetism. Quantitative laws of electric action. Distribution. Electro-static induction of influence. Electric machines. Condensation of electricity. Voltaic cell. Its modifications. Magnetic field due to current. Galvanometers. Ohm's law. Conversion of electric energy into heat. Thermo-electricity. Electro-dynamics. Electro-magnets. Magnetization of iron. Telegraphy.

*Bracketed numbers refer to catalogue 1948-49.

Electro-magnetic induction. Passage of electricity through gases. Magneto and dynamo-electric machines. Dia-magnetism. Connection between electricity and light. Three hours lecture. Second semester.
Prerequisite: Physics 1, 2. Three units.

4. **Physical Laboratory.** To accompany Physics 3. Three hours laboratory. Spring semester.
Prerequisite: Physics 1, 2. One unit.

11. **Mechanics of Solids, Liquids and Gases.** Lectures with illustrations and problems covering the properties of matter, mechanics of solids and fluids. Spring semester. Two units.

12. **General Physics.** Lectures with illustrations and problems in relation to wave motion and sound. Fall semester. Three units.

13. **Physical Laboratory.** To accompany Physics 12. Six hours laboratory. Fall semester. Two units.

14. **General Physics.** Lectures with illustrations and problems in relation to heat and light. Spring semester. Three units.

15. **Physical Laboratory.** To accompany Physics 14. Six hours laboratory. Spring semester.
Prerequisite: Physics 12, 13. Two units.

Courses 11-15 are designed especially for students in the College of Engineering.

104. **Electrical Measurements.** Experimental study of fundamental electric circuit parameters and development of techniques for determination of their values. Limitations on accuracy of measurements are studied. One hour lecture and three hours laboratory. Spring semester.
Prerequisite: E. E. 125. Two units.

121. **Astronomical Physics.** A laboratory course in the study of astronomical, meteorological and seismological phenomena in connection with the Observatory. Hours and credits to be arranged.
Prerequisite: One year of Physics and two years of Mathematics.

POLITICAL SCIENCE

Students who wish to make Political Science their major subject, besides completing the other required courses of the Lower division, must pass courses in History 2A-2B or 4A-4B and Political Science 1-2 with at least a grade of C.

The major program must include 18 units of upper division work in Political Science, with an additional 6 hours which may be taken in a related field approved by the department.

The upper division courses in Political Science must be taken from at least three of the four groups into which the field is divided.

Lower Division

1-2. **Introduction to Government.** A study of the principles and problems of government in the United States and in selected governments abroad. Three hours. Two semesters. Six units.

Reorganized Plan for 1949-50
Upper Division

Group 1, Political Theory and Public Law

118A-118B. (103-104)* **History of Political Doctrines.** A survey of the basic concepts of justice, rights, law and sovereignty as treated by various political philosophers. Three hours. Two semesters. Six units.

157. (101)* **Constitutional Law.** A study of the origin and growth of the federal system in the United States. The development of federal power; the rights of the states and of the citizens. Three hours. One semester. Three units

158. **Government Control of Industry and Labor.** A study of the basis and techniques of governmental regulation to limit competition, protect the national interest, the investor, the consumer and labor. Three hours. One semester. Three units.

Group 2, Government and Politics.

152. (109)* **U. S. Political Parties.** The origin, organization and activities of political parties; campaign techniques; the spoils system; party influence on domestic and foreign policy. Three hours. One semester. Three units.

159. **Basic Political Forces.** The established pattern of American political action; sectional and economic group interests; philosophical, social and historical factors. Three hours. One semester. Three units.

Group 3, Public Administration

149A-149B. **Comparative Government.** A study of selected governments in: A. Latin America and Europe; B. Russia and Asia; their ideology, structure and problems. Six hours. Two semesters. Six units.

160. **Public Relations.** A study of public opinion in the United States; the principles and methods involved in public relations in government, industry and labor. Three hours. One semester. Three units.

172. **State and Local Government.** The development of State and County government; the organization and problems of cities; budgets; planning; police problems; crime prevention. Three hours. One semester. Three units.

181. (102)* **Principles of Public Administration.** Growth of public administrative agencies; their interrelations; organization; personnel; administrative planning. Three hours. One semester. Three units.

Group 4, International Relations

123. (108)* **International Politics.** The growth of the western state system; the problems of nationalism, imperialism and war; attempts at international organization. Three hours. One semester. Three units.

133. (107)* **International Law.** The sources, nature and growth of international law and its functions as part of the legal system of the earth. Three hours. One semester. Three units.

175. **U. S. Foreign Policy and Diplomacy.** An historical sketch of the principles and practices of the United States in foreign affairs; the organization and work of the State Department; the Foreign Service. Three hours. One semester. Three units.

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* Bracketed numbers refer to catalogue 1947-48.

Former Courses Not Listed in Reorganization for 1949-50

105. **American State and County Government.** Constitutional development and governmental organization of the American states and counties, with special reference to California. Three hours. One semester. Three units.

106. **Municipal Government.** The nature, government and problems of cities, particularly in the United States. Three hours. One semester. Three units.

PSYCHOLOGY

1. **General Psychology.** The study of man as a psycho-physiological organism. A general survey of scientific psychology dealing with neural organization and function, sensation, perception, learning, the measurement of intelligence, emotion and feeling, volition, character and personality. A brief survey of divergent schools of psychology. Three hours. Fall semester. Three units.

PUBLIC SPEAKING

1. **Fundamentals of Expression.** The fundamental principles of expression; the speaking voice; body and expressive movement. Training the voice and body to be the willing and obedient servant of the mind. Each student appears in memorized work in class. Two hours. Fall semester. One unit.

2. **Fundamentals of Expression.** A continuation of Course 1, with development of impersonation and interpretation. Two hours. Spring semester. One unit.

3. **Philosophy of Expression.** An advanced study of the principles of expression; advanced training of the voice; embodiment of principles in practice work. A short selected cutting of standard literature is presented by each student at each class. Special training in the interpretation of longer selections for public presentation. Two hours. Fall semester. One unit.

4. **Philosophy of Expression.** A continuation of course 3, with special emphasis upon impersonation, and standard speeches. To hours. Spring semester. One unit.

11. **Fundamentals of Expression.** A short course in expression intended primarily for students in the College of Engineering. Fundamentals of expression; the speaking voice; expressive movement; impersonation; interpretation. Each student must appear in memorized work at each class. One hour. Fall semester. One unit.

12. **Fundamentals of Expression.** A continuation of course 11. One hour. Second semester. One unit.

101. **Aesthetics.** An advanced course where every principle taught in previous courses is put to practical test. Each student is required to memorize and present during the course a short play, in which he impersonates all of the different characters and interprets both the particular parts and the play as a whole. One hour. Fall semester. One unit.

102. **Aesthetics.** A continuation of course 101. One hour. Spring semester. One unit.

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*Bracketed numbers refer to catalogue 1947-48.

107. **Dramatic Seminar.** The mechanics of the theater and the staging of a play, both theory and practice. Lines: voice, body, impersonation. Business: pantomime and stage. Plots: ground, light, scenery, property, Mechanics: illusions and terminology. Criticism: play-reviewing and dramatic criticism. Hours and credits to be arranged.

109. **Debating Seminar.** The application of the principles of expression to the Debate. A study of the particular form of debating. Presentation and arrangement of ideas. Practical application of methods in connection with a major collegiate debate. Hours and credits to be arranged.

RELIGION

(A). **Essentials of Christian Doctrine.** Various creeds. The Apostles' Creed. Each article of the Creed is studied in particular, attention being given to any subject bearing directly on these articles, as Sin, the Powers of the Church, Infallibility, etc. Two hours. Spring semester. One unit.

(B). **Essentials of Christian Doctrine.** The Law of God. What is commanded or forbidden by the Decalogue is studied in detail. The Precepts of the Church, Grace, Prayer, and each of the Seven Sacraments together with collateral subjects. Two hours. Spring semester. One unit.

1. **Fundamental Apologetics.** Revelation; guarantees of Revelation. Documents of Revelation. The authenticity, integrity and reliability of the four Gospels. Two hours lecture. One semester. One unit.

2. **The Church of Christ.** The Catholic Church as the Church of Christ. Its authenticity as a teaching and ruling body. The primacy of St. Peter. The nature and character of Christ's Church. The marks of the true Church of Christ. Two hours lecture. One semester. One unit.

3. **The Existence and Essence of God.** The idea of the belief in God. The nature of Faith. The necessity and certainty of Faith. Sources of proof of God's existence. The nature and essence of God. The attributes of God. Pantheism and Atheism. Fundamental notions of the mystery of the Trinity. Two hours lecture. One semester. One unit.

4. **Creation.** The Creation of the World. Original Justice. Original Sin. The Immaculate Conception. The General Judgment; Heaven; Hell; Purgatory. Two hours lecture. One semester. One unit.

101. **God The Redeemer.** The Mystery of Redemption. The Incarnation. The divine and human natures in Christ. The divine and human wills of Christ, his theandric actions. Two hours lecture. One semester. One unit.

102. **God and Redemption.** The merits of Christ. The Worship of Christ. The devotion to Mary, the Mother of God. The nature and necessity of Grace. Kinds of Grace. Two hours lecture. One semester. One unit.

103. **The Sacraments.** The Sacraments as a means of Grace. The nature and efficacy of the Sacraments. Discussion of the Sacraments of Baptism, Confirmation and the Holy Eucharist. Two hours lecture. One semester. One unit.

104. **The Sacraments.** A continuation of Religion 103. Discussion of the Sacraments of Penance, Extreme Unction, Holy Orders and Matrimony. A discussion of Christian morality. Two hours lecture. One semester. One unit.

105-106. **The New Testament, especially the Four Gospels.** A word for word explanation of the text. Apparent discrepancies explained and harmonized. Two hours. Both semesters. Two units.

SPANISH

1. **Elementary Spanish.** Elements of Spanish grammar. Drill in pronunciation. Vocabulary. Three hours. Fall semester. Three units.

2. **Elementary Spanish.** A continuation of Spanish 1. Syntax, oral and written exrecises. Reading from the simpler Spanish prose. Three hours. Spring semester.
Prerequisite: Spanish 1. Three units.

3. **Intermediate Spanish.** Review of grammar and syntax. Oral and written exercises. Reading of somewhat difficult Spanish prose. Three hours. Fall semester.
Prerequisite: Spanish 2. Three units.

4. **Intermediate Spanish.** Reading, written and oral exercises. This course aims at preparing the student to read the more difficult Spanish writers. Three hours. Spring semester.
Prerequisite: Spanish 3. Three units.

5, 6. **Advanced Composition and Reading.** Composition; sight reading; oral and written reports in Spanish; historical survey of Spanish literature. Conducted almost entirely in Spanish. Three hours. Both semesters. Six units.

101. **Survey of Spanish Literature.** Survey of literature from its origin to the "Siglo de Oro". Study of representative works in the field of the novel, the drama and poetry of the period. Fall semester. Three units.

102. **Survey of Spanish Literature.** (Continued). Lectures and commentaries, mostly in Spanish, on the literature of Spain from the period of decadence to the XX century. Reading and discussion of representative works which illustrate literary trends from the XVIII century to the Modernista movement. Spring semester. Three hours. Three units.

103. **Masterpieces of Spanish Literature of the "Siglo de Oro".** Reading and interpretation of representative Spanish texts. Three hours. Fall semester.
Prerequisite: Spanish 102 or equivalent. Three units.

104. **Masterpieces of Modern Spanish Literature.** Study and reading of selected modern plays and novels typical of Spanish life, culture and thought. Three hours. Spring semester.
Prerequisite: Spanish 103 or equivalent. Three units.

THE OBSERVATORY

ASTRONOMICAL, METEOROLOGICAL AND SEISMOLOGICAL OBSERVATORY

John Anthony Weber, S.J.
Director

Albert Joseph Newlin, B.S., J.D., D.Sc.
Assistant Director

The Astronomical and Meteorlogical Observatories were under the immediate direction of the late Father Ricard, known throughout the country as the "Padre of the Rains." In recognition of the work of Father Ricard, the Knights of Columbus of California built the Knights of Columbus Ricard Memorial Observatory, which provides the facilities and equipment for a much more comprehensive investigation of astronomical and meteorological problems, and a correspondingly greater service to the country.

Through its Seismological Station the University is a member of a chain of seismological stations maintained by the Jesuits throughout the world, and has been a pioneer on the Pacific Coast in the recording and observation of seismological disturbances, as well as in the study of their causes.

The University Seismological Station operates two Wiechert seismographs, consisting of one vertical and two horizontal components. Recently, however, a new impetus has been given this branch of geophysical investigation by the construction of a vault embodying all that was found best and latest in stations of this type. The Seismological Station is now in possession of three new Galitzin Seismometers of the long-period type, and two horizontal components of the Wood-Anderson Seismometers which were constructed at Pasadena for this Station, all of which are located in the new vault. The Wood-Anderson Seismometers have been designed for a special study of local earthquakes and are the short-period type. Finally, the University hopes to complete this station by the installation of a "Shortt Synchronome Clock," thus assuring accurate time for all our records.

Of special prominence, however, is the work which has been done in long range weather forecasting through a study of sun spots. This line of study was instituted by the late Father Ricard over a generation ago and in the meantime he has built up a large mass of data in this regard, so that the records and observations at the University are perhaps the most complete of any in the country. Monthly forecasts are sent out regularly from the Observatory. With the aid of such new instruments as the 18.5-inch reflector and the spectroheliograph, the Director of the Observatory will be enabled to pursue his researches with greater facility and success.

THE BUREAU OF RESEARCH

Stuart Parry Walsh
Director

The newly established Bureau of Research is an agency through which the various departments of the University may undertake studies of basic and practical problems relating to their respective fields. The Bureau will make arrangements with private and public organizations or individuals desiring to have such studies made in matters of business, engineering, law, science, history, etc., where the special talents and facilities of the University can be made available. Faculty members, senior students, and ultimately graduate students, will have opportunities to work on these research problems in their particular areas of specialization.

In addition to specific research projects, the Bureau will arrange for seminars, institutes, refresher courses, and conferences at the University or elsewhere, on subjects of interest to business, professional, and civic groups. The Bureau will also undertake the publication of appropriate monographs, surveys, and reports resulting from research and conference activities.

Requests for information about the services and facilities of the Bureau of Research should be addressed to the Director, at the Administration Building on the University campus.

DEGREES CONFERRED

JUNE 18, 1949

DEGREES IN COURSE

ELECTRICAL ENGINEER

Rex F. Harris

BACHELOR OF ARTS

**John R. Banister
Antony J. Panzica
*Martin E. Whelan, Jr.

BACHELOR OF LAWS

Thomas J. Arata
Carroll F. Byrd †
William R. Christy
Howard S. Dattan †
Frank Domenichini †
William J. Foley †
Daniel Haley
Ralph R. Harlan †
Robert G. Hinshaw †
Ronald A. Hosking
John A. Klein †
Charles F. Leach †
Neil R. McAllister, Jr. †
James E. McKenna, Jr.
Ronald H. Maas
James F. Mastoris
John G. Matthews †
Timothy A. O'Connor
Michael C. O'Neil †
William W. Penaluna †
John A. Pitre †
Jack Rainville †*
Frederick S. Reinheimer †
Edouard E. Robert
Mark A. Ronan
Anthony J. Sota †
William F. Watson †
Robert C. Wreisner †
James A. Wright †

BACHELOR OF SCIENCE

BIOLOGY

Lawrence J. Bargetto
Thomas E. Donnelly
Thomas N. Fast
Patrick E. Golden
George E. Grenfell
Robert A. Helfrich
William T. Kelley
Alfred S. Maida ***
Donald E. Sullivan

CHEMISTRY

John E. Campion ***
Roland W. King, Jr.

ECONOMICS

Philip M. deBord
John V. Diepenbrock **
George C. Filice
Robert F. Infelise
Robert A. Kenealey
John S. McInerny
Charles L. Morton
George V. Nichols, Jr.
Robert E. Sparks

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† Course completed January 21, 1949.

ENGLISH

John F. Bennett
Melbourne F. Berlinger
Harry S. Curry, Jr.
Bernard J. McCormick *
Paul M. McCormick
William W. Peach
William F. Sheridan

HISTORY

Thomas A. Barakatt
Edward U. Bevilacqua
Bernard P. McCullough
Dave G. Mariani
Daniel P. Murphy
Weston L. O'Reilly
Warren W. Spindler

PHILOSOPHY

Roland W. Belanger
Francis L. Keegan *
Maurice T. Shea

POLITICAL SCIENCE

John T. Abbott
Joseph C. Anderson
Alessandro M. Baccari, Jr.
John J. Faber *
John L. Feeney, Jr.
Olivier R. Fourie
Tally P. Mastrangelo
Eugene L. Mello
John T. O'Neill, Jr. †
Thomas H. Rosewall, Jr.
Edward L. Silva
William J. Sullivan*
Dominic F. Torcasso
Thomas O. Tuttle

BACHELOR OF CIVIL ENGINEERING

Alfred E. Bacher *
Richard R. Blackburn *
John J. Conrado
Edward L. Fonseca
Thomas J. Ford, Jr.
E. Jackson Going, Jr.
Luis Gomez
Robert T. Greene
Robert C. Huttlinger
Roy E. Oakes
Joseph A. Rechenmacher
Edward Van Vranken
John J. White

BACHELOR OF ELECTRICAL ENGINEERING

Victor M. Cassimus
Peter B. Engh
Joseph E. Filice
Philip B. Gallagher ***
Stephen J. Herle
Donald W. Latshaw, Jr.
Carl A. Schneider, Jr.
Richard L. Smith
Joseph N. Ylarraz

BACHELOR OF MECHANICAL ENGINEERING

John R. Barber
Richard L. Bauer
Fred J. Beck
Alexander F. Beltrami
Andrew T. Byrne
Francis P. Croak
Joseph J. Crowley
William J. Cuneo
John D. Frazer
Warren M. Harrison
James H. Heacock
Harold J. Heger
Robert M. Jirgal
Charles H. Johnson
John E. Pappas
Francis R. Perry
Philip G. Rizzo
Anthony F. Rodrigues
William J. Ronchelli
William W. Steffan
Keith E. Swanson

BACHELOR OF SCIENCE

COMMERCE

Michael J. Adza
Freeman W. Andrews
James B. Arbios
James F. Aubrey
Ralph V. Bargetto
Steve R. Belluomini
Cornel J. Borghello
Robert E. Boscacci
James F. Bowe
Ben B. Cassinerio
Moses P. Chavez
Robert O. DeCoursey
James E. Donati
William F. Donnelly
Hugh W. Donovan *
Michael J. Donovan
Jerome C. Fahey
Byron R. Fassett*
Joseph P. Fialho
Donald E. Foxworthy
Walter B. Franck
Robert M. Galligan
Guy G. Giacopuzzi, Jr.
Anthony J. Giansiracusa
Joseph J. Gleason, Jr.
Gerald C. Griffin
Vernon H. Hare
Robert L. Hausmann
Richard L. Hennessy
Eugene L. Heyburn
Edward T. Keelan, Jr.
Thomas J. Kelly
Richard T. Kennedy
Fred A. Lico
William M. Luse
Thomas McInerney
John B. MacDonald, Jr.
Edward C. Maffeo
Lynn R. Marsh
Albert H. Martin
Clarence J. Mateik
John P. Monks
Cornelius J. Moynihan
Thomas J. Nestor
James K. O'Brien *
James J. O'Connell
Patrick J. O'Halloran, Jr.
Albert T. Olivier
Robert J. Quigley, Jr.
Herman J. Ravizza
Edward F. Regan
William B. Renna
James W. Ross
Charles P. Sambrailo, Jr.
Darrell M. Sanders
John W. Scherrer
Quentin H. Smith
Dean D. Snyder
David C. Terry
Anthony F. Villafranca
Frank S. Villareal
Robert C. Wehner

*** Maxima cum laude
** Magna cum laude
* Cum laude

ALPHA SIGMA NU

The following graduates are members of Alpha Sigma Nu, the national Jesuit honor society.

Adza, Michael J.
Bacher, Alfred E.
Banister, John R.
Bowe, James F.
Campion, John E.
Diepenbrock, John V.
Engh, Peter B.
Gallagher, Philip B.
O'Brien, James K.
Rainville, Jack J.

EXTRAORDINARY PRIZES

Academic Year

1949

The Nobili Medal, founded by Joseph A. Donohoe, Esq., for the student deemed first in morals, obedience, and application to study, was awarded to Frank L. Keegan.

> **Next in Merit:** Philip B. Gallagher, Alfred S. Maida, James B. Arbios, Michael J. Adza, Alfred E. Bacher, John E. Campion, James F. Bowe, John R. Banister, and Jerome C. Fahey.

The Silver Medal, for the resident student distinguished for conduct and application, was awarded to James F. Bowe.

> **Next in Merit:** James B. Arbios, Michael J. Adza, Jerome C. Fahey, William F. Donnelly, Donald E. Sullivan, Alfred E. Bacher, William J. Ronchelli, John J. Conrado, Cornelius J. Moynihan, William T. Kelley, and Thomas E. Donnelly.

The Silver Medal, for the non-resident student distinguished for conduct and application, was awarded to Alfred S. Maida.

> **Next in Merit:** John R. Banister, Richard R. Blackburn, Hugh W. Donovan, Philip B. Gallagher, Frank L. Keegan, James K. O'Brien, Antony J. Panzica, and William J. Sullivan.

The Ryland Prizes, for excellence in the annual Ryland Debate, were awarded as follows: first prize to William B. Macomber, second prize to Leo P. Bailey, Jr., third prize to Joseph F. Greco.

The Orella Prize, founded by Dr. and Mrs. Firmin R. Orella, to be given to the senior student in the Department of Science who attained the highest average in scientific subjects during the junior and senior years, was awarded ex aequo to John E. Campion Jr., and Alfred S. Maida.

The Handlery Prize, founded by Mrs. Rose Handlery in honor of her son, Raymond, of the class of 1934, to be given to the senior student who contributed most to the success of any of the University student publications, was awarded to James F. Bowe.

The Chargin Prize, in honor of Mr. and Mrs. Joseph A. Chargin, Sr., to be given to the senior student in the College of Law who maintained the higest class average throughout his law course, was awarded to Jack J. Rainville.

The Bancroft-Whitney Company Prize, a set of law books to be presented to the member of the senior class in Law having the highest average was awarded to Jack J. Rainville.

A subscription to the Advance California Reports, the gift of the Recorder Printing and Publishing Company to be awarded to the graduating student in the College of Law who attained the highest average during the final year was awarded to Howard S. Dattan.

The Business Administration Association Key, given to the senior student with the highest academic average in the College of Business Administration, was awarded to Hugh W. Donovan.

The McCann Prize, founded in honor of Daniel B. McCann, to be given for the best short story, was awarded to James C. O'Neill.

Next in Merit: George E. Murphy, Jr., Arthur D. Keil, Joseph V. Reynolds.

The Owl Prize, founded by the directors of the former College Magazine, "The Owl," to be given to the one most successful in the oratorical contest, was awarded to John R. Banister.

The Dramatic Art Prize, founded in honor of Mr. William H. Leahy by his wife and by his brother, Mr. James Leahy, for the winner of the Dramatic Art Contest, was awarded to Albert G. Thompson.

The Redwood Prize, for the best essay on an historical subject, was awarded to John S. McInerny.

Next in Merit: Charles Hugh Fee, M.D., Cornelius M. Buckley.

The San Jose Civic Club Prizes, presented by a group of San Jose business and professional men to encourage interest in the study of the Italian language and culture, to be given to the three students most diligent in the study of Italian were awarded to Mauro Naccarato, Joseph F. Greco and Robert C. Gilkey.

REGISTER OF STUDENTS
1949 - 50

Abbreviations Used

A. & S. — College of Arts and Sciences
B.A. — College of Business Administration
Engr. — College of Engineering
Ev. — Evening Division
Fr. — Freshman
Jun. — Junior
Sen. — Senior
Soph. — Sophomore
Spec. — Special Student

Aboitiz, Ernesto	Fr. Engr.	Cebu, Cebu, P. I.
Aboitiz, Luis M.	Jun. Engr.	Cebu, Cebu, P. I.
Aboitiz, Xavier C.	Soph. Engr.	San Francisco
Achterman, Karl G.	Fr. Engr.	San Jose
Acronico, Gene C.	Jun. Engr.	San Jose
Adair, Harland C.	Ev. B.A.	San Jose
Adams, Donald M.	Jun. B.A.	Fresno
Aderman, William K.	Ev. B.A.	San Jose
Agnello, Joseph A.	Fr. B.A.	Monaca, Pennsylvania
Aguilar, William P.	Fr. B.A.	Palo Alto
Aherne, Gregory D.	Jun. A. & S.	Los Gatos
Albertazzi, Victor J.	Fr. A. & S.	Napa
Albertson, James S.	Jun. A. & S.	Los Gatos
Allaire, Basil I.	Soph. A. & S.	Carmel
Allen, Edward J.	Jun. A. & S.	Yreka
Allen, Glenn C.	Law II	Topaz
Almeida, Damien C.	Soph. B.A.	Honolulu, T. H.
Alvarez, Jose R.	Soph. Engr.	Panama, Panama
Alvarez-Calderon, Alberto	Soph. B.A.	Lima, Peru
Amaral, Edward A., Jr.	Sen. B.A.	San Jose
Amrhein, Raymond A.	Law I	Corning
Anderson, Daniel A.	Soph. A. & S.	Oakland
Anderson, Edwin J.	Sen. Engr.	Oakland
Anderson, John A.	Soph. A. & S.	Del Monte
Anderson, Sedric E.	Fr. Engr.	San Jose
Andrade, Louis G.	Ev. B.A.	San Jose
Andreatta, Robert V.	Sen. A. & S.	Mt. Shasta
Antonini, Frank P.	Jun. Engr.	San Francisco
Antonioli, William A.	Sen. A. & S.	Mt. View
Apellaniz, Jose A. F.	Jun. Engr.	Iloilo City, P. I.
Archer, Richard J.	Ev. B.A.	San Jose

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Arena, Vincent T.	Sen. B.A.	Phoenix, Arizona
Arioto, Anthony G.	Jun. Engr.	Stockton
Arnulphy, Louis G.	Jun. B.A.	Hongkong, China
Aron, John G.	Fr. A. & S.	Madera
Arrowsmith, Robert R.	Soph. A. & S.	Los Gatos
Askue, Robert A.	Ev. B.A.	San Jose
Atchison, Rodney R.	Law I	Santa Cruz
Au, Robert H.C.	Fr. Engr.	Honolulu, T. H.
Austin, James E.	Fr. A. & S.	San Jose
Aversente, James F.	Soph. A. & S.	San Jose
Azevedo, Harold L.	Ev. B.A.	Santa Clara
Azevedo, Larry D.	Fr. Engr.	San Jose
Babb, B. Milford	Soph. B.A.	Phoenix, Arizona
Bachan, Paul W.	Law II	Watsonville
Bachino, Robert P.	Soph. A. & S.	San Luis Obispo
Bacon, John W.	Soph. A. & S.	Burlingame
Bailey, Leo P.	Soph. B.A.	San Francisco
Baiocchi, Gerald N.	Soph. B.A.	San Jose
Baird, Miriam A.	Ev. B.A.	San Jose
Baldini, Daniel A.	Sen. B.A.	Redwood City
Banducci, Dominic D.	Fr. A. & S.	Eureka
Bane, William E.	Soph. Engr.	Sunnyvale
Banister, Ronald H.	Fr. Engr.	San Jose
Barakatt, Thomas A.	Law II	Stockton
Barkett, Joseph A.	Sen. A. & S.	Stockton
Barrette, John D.	Fr. Engr.	San Jose
Bartell, Charles D.	Jun. Engr.	San Francisco
Bartlett, Jack H.	Jun. A. & S.	Corcoran
Bartlett, Stuart R.	Sen. A. & S.	Corcoran
Bascio, Patrick A.	Spec. A. & S.	Los Gatos
Bauer, Joseph G.	Ev. B.A.	Mt. View
Bean, James E., Jr.	Ev. B. A.	San Jose
Beatty, Harold L.	Sen. A. & S.	Los Gatos
Beaudet, Philip J.	Sen. Engr.	Santa Clara
Beck, William R.	Ev. B.A.	San Jose
Becka, Robert T.	Jun. A. & S.	Los Gatos
Bedolla, Charles M.	Sen. A. & S.	Chualar
Bedolla, Ernest D., Jr.	Sen. A. & S.	Chualar
Beebe, Gerald J.	Fr. Engr.	Oakland
Belcamino, Joseph F.	Law I	Springfield, Mass.
Bellantonio, Giuseppe	Jun. A. & S.	Naples, Italy
Bell, James W.	Ev. B.A.	Campbell
Belloli, Will J.	Ev. B.A.	San Jose
Bender, James H.	Jun. A. & S.	Vallejo
Benenato, Joseph R.	Soph. B.A.	Phoenix, Arizona
Benevento, Richard V.	Ev. B.A.	San Jose
Beraldo, Dewey F.	Jun. Engr.	Burlingame
Berlin, Sidney L.	Law I	Fresno

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Bernal, Bernard C.	Fr. A. & S.	San Jose
Berroyer, William L.	Ev. B.A.	San Jose
Berry, Lewis R.	Ev. B.A.	San Jose
Berryessa, Jerald J.	Soph. A. & S.	Mt. View
Bertagna, Albert O.	Fr. Engr.	San Mateo
Bettencourt, Philip E.	Jun. B.A.	Sunnyvale
Bettencourt, Raymond R.	Fr. A. & S.	Centerville
Bettinger, Clifford S., Jr.	Sen. B.A.	San Mateo
Biasatti, Edo S.	Fr. B.A.	Dallas, Texas
Biasotti, David A.	Sen. B.A.	San Mateo
Bianchi, Eugene C.	Fr. A. & S.	Los Gatos
Biglieri, Natale J.	Jun. Engr.	San Francisco
Binckley, Basil C.	Sen. Engr.	Claremont
Binckley, James E.	Sen. Engr.	Claremont
Bishop, Gerald T.	Ev. B.A.	Campbell
Bishop, Grant R.	Law III	Los Gatos
Bither, Preston J.	Sen. B.A.	Redwood City
Blach, James P.	Sen. A. & S.	Los Altos
Blach, Richard H.	Soph. A. & S.	Los Altos
Blaisdell, Carl A.	Ev. B. A.	San Jose
Blake, Freeman D.	Sen. A. & S.	Santa Clara
Blake, Philip C.	Fr. A. & S.	Los Gatos
Blake, Robert G.	Fr. A. & S.	Santa Clara
Bluth, Thomas D.	Jun. A. & S.	Los Gatos
Boland, Martin J.	Ev. B.A.	Santa Clara
Bolger, Patrick A.	Fr. A. & S.	Los Gatos
Bolton, Robert A.	Soph. A. & S.	Piedmont
Bonnel, John W.	Soph. B.A.	Martinez
Bordenave, Donald J.	Fr. A. & S.	Redwood City
Borello, Pierino J.	Fr. B. A.	Mt. View
Borello, Silvio E.	Jun. B.A.	Sunnyvale
Borges, Joseph F.	Jun. A. & S.	San Leandro
Boris, Edward A.	Fr. Engr.	Oakland
Borkenhagen, James L.	Sen. A. & S.	Santa Ana
Borra, Livio G.	Soph. Engr.	San Francisco
Borrelli, Dominic	Ev. B.A.	San Jose
Bottero, Frank L.	Fr. B.A.	Monterey
Boulger, Martin G.	Fr. A. & S.	Los Angeles
Bounds, Robert I.	Law II	Yakima, Washington
Bouquet, Pierre F.	Jun. B.A.	San Mateo
Bovello, Angelo J.	Soph. B.A.	Washington, D. C.
Bowden, John D.	Jun. Engr.	San Diego
Bower, John J.	Sen. A. & S.	Santa Cruz
Boyd, Claude J.	Jun. Engr.	San Francisco
Boyd, Joseph A.	Jun. B.A.	San Francisco
Boyle, Harry H.	Jun. A. & S.	Burlingame
Boyle, James M.	Sen. A. & S.	Monterey
Boyle, John L.	Soph. A. & S.	Los Gatos
Boyle, Neil A.	Sen. A. & S.	Seattle, Washington

Bozzo, Carl E.	Fr. A. & S.	San Jose
Bracchi, Ernest C.	Soph. A. & S.	Los Gatos
Bradley, Robert L.	Sen. Engr.	San Jose
Brady, Charles Q., Jr.	Jun. B.A.	Beverly Hills
Brady, William J.	Fr. A. & S.	Portland, Oregon
Braten, Miles B.	Sen. B.A.	Oakland
Braus, Robert J.	Jun. A. & S.	Los Gatos
Breda, Lovin P.	Ev. B.A.	San Jose
Bregante, Anthony C.	Sen. B.A.	San Diego
Brice, Ralph E.	Fr. A. & S.	Santa Barbara
Brierly, Francis A.	Soph. Engr.	San Francisco
Briggs, Donald W.	Jun. Engr.	San Leandro
Brill, Maurice J.	Fr. A. & S.	Los Gatos
Brinton, Richard B.	Fr. A. & S.	Livermore
Britschgi, Robert H.	Soph. Engr.	Redwood City
Britton, Frank R.	Sen. B.A.	Calexico
Brock, Dallas D.	Soph. B.A.	San Francisco
Brophy, Robert J.	Jun. A. & S.	Los Gatos
Brown, Ben	Soph. B.A.	East Chicago, Indiana
Brown, Laurance W.	Sen. Engr.	Burlingame
Brown, Maurice B.	Sen. B.A.	Sunnyvale
Brown, Maxfield J.	Sen. Engr.	Beverly Hills
Brown, Richard H.	Jun. A. & S.	Los Gatos
Browne, Allen G.	Jun. A. & S.	Los Angeles
Bruno, Frank V., Jr.	Sen. A. & S.	Monterey
Brunski, Leo J.	Ev. B.A.	San Jose
Bryan, William F.	Law III	Salinas
Buckley, Cornelius M.	Sen. A. & S.	San Mateo
Buckley, Daniel J.	Sen. A. & S.	Seattle, Washington
Buckley, Gerald P.	Fr. A. & S.	San Mateo
Buckley, Thomas C.	Soph. A. & S.	South Pasadena
Bunce, Bernard P.	Fr. B.A.	Eureka
Burger, Edmund G.	Jun. Engr.	Lafayette
Burget, Henry V.	Soph. B.A.	Concord
Burns, Thomas S.	Fr. A. & S.	San Mateo
Butier, Mark M.	Jun. Engr.	Los Angeles
Butler, Leroy B.	Fr. Engr.	Los Angeles
Butler, William C.	Ev. B.A.	Los Altos
Buty, Francis X.	Sen. B.A.	Sen Francisco
Bynum, Daniel R.	Ev. B.A.	Sunnyvale
Byrd, Thomas M.	Jun. B.A.	Pomona
Byrne, James E.	Sen. Engr.	San Jose
Byrne, Ramon L.	Ev. B.A.	San Jose
Caballero, Alex	Ev. B.A.	San Jose
Cacho, Alfonso J.	Jun. Engr.	Manila, P. I.
Cadigan, John M.	Fr. A. & S.	Seattle, Washington
Calegari, Marc A.	Fr. A. & S.	Los Gatos
Caletti, Richard C.	Sen. Engr.	San Rafael

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Callaghan, Philip P.	Soph. A. & S.	Los Gatos
Callahan, John W.	Fr. A. & S.	Sacramento
Callahan, John P.	Jun. A. & S.	Los Gatos
Callejon, Donald J.	Soph. A. & S.	San Jose
Cambra, Joseph M.	Soph. Engr.	Santa Clara
Cameron, James E.	Ev. B.A.	San Jose
Campana, Joseph H.	Soph. Engr.	San Francisco
Campbell, Thomas C.	Sen. Engr.	Burlingame
Campbell, William E.	Jun. Engr.	Cotati
Campi, Richard B.	Jun. Engr.	Glendale
Campo, Frederick W.	Ev. B.A.	San Jose
Canelo, James C.	Sen. B.A.	San Francisco
Canepa, Louis E.	Ev. B.A.	San Jose
Cannon, James H., Jr.	Jun. Engr.	Pasadena
Cano, Albert Q.	Ev. B.A.	San Jose
Canty, James D.	Sen. A. & S.	Oakland
Capitolo, Mario L.	Fr. A. & S.	Los Gatos
Capurro, Adolph J.	Fr. A. & S.	San Francisco
Caputo, Richard P.	Fr. A. & S.	San Jose
Carbone, Juan A.	Soph. A. & S.	Panama, Panama
Carmody, Robert C.	Fr. A. & S.	Denver, Colorado
Carpenter, John T.	Ev. B.A.	Philadelphia, Pennsylvania
Carroll, George A.	Soph. A. & S.	Los Gatos
Carter, Walter A.	Ev. B.A.	San Jose
Cashman, Richard J.	Sen. Engr.	San Francisco
Cassayre, Paul M.	Soph. Engr.	Napa
Cassetta, Salvatore F.	Law I	Elmira, New York
Cassimus, Richard F.	Fr. Engr.	Oakland
Casterson, Wilmer E.	Ev. B.A.	Campbell
Castillo, Enrique	Soph. Engr.	Panama, Panama
Cauhape, Francis E.	Ev. B.A.	San Jose
Caulfield, Joseph P.	Jun. B.A.	Oakland
Caulfield, Thomas M.	Soph. A. & S.	Oakland
Cavagnaro, James F.	Jun. B.A.	Palo Alto
Cavallini, Frank R.	Fr. B.A.	Los Gatos
Cavanaugh, Bartley W.	Soph. B.A.	Sacramento
Cebrian, Albert P.	Fr. Engr.	Santa Clara
Cecchetti, William J., Jr.	Fr. A. & S.	Santa Clara
Celeri, William G.	Sen. B.A.	Fort Bragg
Cerney, Reid C.	Soph. A. & S.	Pacific Grove
Cerney, Thomas W.	Sen. B.A.	Pacific Grove
Chargin, James E.	Fr. A. & S.	San Jose
Charrette, Walter D.	Fr. A. & S.	Antioch
Chasuk, Alfred P.	Law III	Los Angeles
Chavez, Edward J.	Soph. B. A.	Vallejo
Chirico, Nicolina	Ev. B.A.	San Jose
Clark, Francis J.	Soph. A. & S.	Stony Point, New York
Clark, Fred N.	Ev. B.A.	Redwood City
Clark, Herbert E.	Sen. B.A.	Phoenix, Arizona

Clark, John W., Jr.	Jun. A. & S.	Los Gatos
Clark, Ora I.	Ev. B.A.	San Jose
Clark, William G.	Law III	Redwood City
Clevenger, James H.	Law II	San Mateo
Clinch, Watt B.	Soph. Engr.	San Francisco
Col, Eugene E.	Ev. B.A.	San Jose
Cole, Mary-Charles	Ev. B.A.	San Jose
Cole, Stanley S.	Soph. A. & S.	Menlo Park
Cole, Wilbur C., Jr.	Law III	San Jose
Coles, James A.	Fr. B.A.	San Carlos
Collins, Andrew J.	Jun. A. & S.	San Francisco
Colombini, Richard L.	Soph. A. & S.	Tacoma, Washington
Combs, George B.	Jun. Engr.	Vallejo
Campagno, Helen C.	Ev. B.A.	Cupertino
Coniglio, Peter J.	Jun. A. & S.	Monterey
Conn, Paul J.	Sen. A. & S.	Pasadena
Conn, Thomas V.	Fr. A. & S.	Los Gatos
Connell, Daniel F.	Fr. A. & S.	San Francisco
Connolly, Arthur E.	Soph. A. & S.	Los Gatos
Constantino, Thomas	Fr. B.A.	San Jose
Contreras, Gilbert F.	Ev. B.A.	San Jose
Convery, Thomas J.	Sen. Engr.	San Francisco
Cook, William A.	Ev. B.A.	Redwood City
Cooley, Philip E.	Jun. Engr.	Redwood City
Cooley, Robert J.	Sen. A. & S.	Redwood City
Coolidge, Helen E.	Ev. B.A.	San Jose
Cooney, Gerald L.	Jun. A. & S.	Los Gatos
Cooper, Louis M.	Soph. A. & S.	Beverly Hills
Copenhagen, Otto J.	Jun. B.A.	Piedmont
Costa, Vernon L.	Fr. A. & S.	Hayward
Costanza, Daniel J.	Fr. A. & S.	San Jose
Costaregni, Daniel J.	Fr. A. & S.	Los Gatos
Cotrell, Robert J.	Fr. A. & S.	Manteca
Cotta, Richard P.	Fr. A. & S.	Visalia
Coughlin, Martin J., Jr.	Fr. A. & S.	San Bernardino
Cowan, James H.	Fr. Engr.	Pittsburg
Cox, Charles W.	Sen. Engr.	Los Gatos
Coyle, Cyril A.	Jun. A. & S.	Sacramento
Coyle, Kevin C.	Soph. A. & S.	Menlo Park
Coyne, Lloyd D.	Soph. Engr.	Oakland
Coyne, Robert F.	Sen. Engr.	Los Angeles
Coz, Richard T.	Soph. A. & S.	Los Gatos
Cozad, James W.	Jun. B.A.	Redwood City
Crespi, Lauren A.	Fr. B.A.	Angels Camp
Cristallo, Anthony J.	Sen. A. & S.	Visalia
Crompton, Richard E.	Jun. A. & S.	Mt. View
Cronin, John F.	Fr. A. & S.	Los Angeles
Crosby, Thomas C.	Fr. Engr.	Bishop
Crotty, Charles J.	Jun. B.A.	San Mateo

Crowley, Andrew G.	Fr. B.A.	Burlingame
Crowley, George D.	Jun. B.A.	San Francisco
Crowley, William J.	Ev. B.A.	San Jose
Cruza, Thomas E.	Sen. A. & S.	Oakland
Cullen, Philip J., Jr.	Sen. A. & S.	San Anselmo
Cummings, Donald C.	Soph. A. & S.	Robles del Rio
Cummings, Laurence R.	Fr. A. & S.	Robles del Rio
Cunningham, Basil E.	Fr. A. & S.	Redondo Beach
Cunningham, Charles J.	Law I	Ardmore, Pennsylvania
Cunningham, James O., Jr.	Jun. A. & S.	San Jose
Cunningham, Wilfrid J.	Fr. A. & S.	San Anselmo
Cunz, Jerry I.	Soph. A. & S.	Seattle, Washington
Curtis, James E.	Ev. B.A.	San Francisco
Cutler, Albert	Ev. B.A.	San Jose
Cutler, A. Richard, Jr.	Fr. A. & S.	Visalia
Dacanay, Joseph A.	Jun. A. & S.	Los Gatos
Dachauer, Andrew C.	Fr. A. & S.	Los Gatos
Dains, Edmund C.	Ev. B.A.	San Jose
Dal Poggetto, Newton F., Jr.	Ev. B.A.	Santa Clara
Dalton, John J.	Sen. A. & S.	Redwood City
Daly, James W.	Soph. A. & S.	Stockton
Daly, John A.	Fr. A. & S.	Hollywood
Daly, Kevin R.	Fr. A. & S.	San Francisco
D'Amico, John C., Jr.	Fr. B.A.	Seattle, Washington
Damon, Duane L.	Law I	Atherton
Daniels, William E.	Jun. Engr.	San Francisco
D'Arcy, Richard L.	Jun. A. & S.	Los Gatos
Davis, Bruno A.	Jun. Engr.	San Francisco
DeBorba, Gilbert F.	Law II	Centerville
Decker, Raymond G.	Soph. A. & S.	San Jose
Deeney, William F.	Jun. A. & S.	Los Gatos
Deering, Michael A.	Soph. A. & S.	San Francisco
Defilippis, Eugene L.	Jun. A. & S.	Rutherford
DeGeller, Donald J.	Law I	Redwood City
Degnan, John C.	Fr. A. & S.	Crescent City
Deihle, Paul F.	Soph. B.A.	Hayward
De la Guardia, Robert T.	Jun. Engr.	Panama, Panama
Delaney, James J.	Jun. A. & S.	Fair Oaks
Delaney, Thomas P.	Fr. A. & S.	Los Gatos
Delano, Robert	Law I	San Francisco
Deleuran, Paul R.	Ev. B.A.	San Jose
Del Missier, Richard J.	Fr. Engr.	Seattle, Washington
DeLorimier, James W.	Jun. B.A.	Pacific Grove
DeLorme, Robert	Sen. B.A.	Burlingame
DeLuna, Severo	Soph. B.A.	Santa Clara
DeMartini, Alfred J., Jr.	Jun. A. & S.	San Francisco
DeMattei, Gaeton A.	Sen. A. & S.	San Mateo
Deming, Vernon K.	Ev. B.A.	San Jose

Dempsey, Gerald M.	Jun. B.A.	San Carlos
Dempsey, Raymond J.	Law I	San Mateo
DeRegt, Jack S.	Sen. Engr.	San Francisco
Derry, Edward J.	Fr. A. & S.	Atherton
Desmond, Gerald M.	Jun. B.A.	Sacramento
Devine, Harry J.	Sen. B.A.	Sacramento
Dias, Joseph T.	Ev. B.A.	San Jose
Diaz, Demetrio, Jr.	Sen. A. & S.	San Jose
DiCorti, Vincent J.	Sen. B.A.	San Francisco
Diepenbrock, Anthony B.	Sen. A. & S.	San Mateo
Diepenbrock, Robert J.	Jun. A. & S.	Sacramento
DiLeonardo, Michael	Law III	San Jose
Dills, Charles M.	Sen. Engr.	North Hollywood
Dimond, Otto W.	Ev. B.A.	Alma
Dinapoli, Richard L.	Sen. B.A.	San Jose
Ditomaso, Vincent A.	Sen. Engr.	San Fernando
Doherty, Robert B.	Jun. Engr.	LaCanada
Dominick, Robert M.	Jun. Engr.	San Jose
Donati, John A.	Ev. B.A.	San Jose
Donovan, Daniel E.	Fr. A. & S.	Santa Clara
Dooher, Joseph M.	Sen. B.A.	San Mateo
Doolittle, William J.	Sen. Engr.	Los Angeles
Dowling, James M.	Jun. Engr.	San Marino
Dowse, Cecil E.	Ev. B.A.	San Jose
Doyle, Anthony D.	Jun. Engr.	Chicago, Illinois
Doyle, Giles A.	Soph. A. & S.	Valparaiso, Indiana
Doyle, James E.	Sen. A. & S.	Redwood City
Doyle, John T.	Sen. A. & S.	Portland, Oregon
Draper, James R.	Jun. A. & S.	Los Gatos
Driscoll, James E.	Fr. B.A.	Redwood City
Driscoll, Gerald J.	Fr. A. & S.	San Mateo
Druding, Frank	Sen. Engr.	Philadelphia, Pennsylvania
Drummey, Jack E.	Jun. A. & S.	Seattle, Washington
Duffy, William T., Jr.	Fr. Engr.	Redwood City
Dung, Abraham	Soph. B.A.	Honolulu, T. H.
Dunham, Edna M.	Ev. B.A.	Sunnyvale
Dunlap, James R.	Soph. A. & S.	Edwardsville, Illinois
Dunlap, Joseph R.	Sen. A & S.	Redwood City
Dunn, John P.	Law I	Monrovia
Dutra, Eugene M.	Ev. B.A.	Sunnyvale
Duzanica, John N.	Sen. B.A.	Redwood City

Easton, Leslie D.	Ev. B.A.	San Jose
Easton, Raymond A.	Soph. B.A.	Chicago, Illinois
Ebert, Robert A.	Sen. Engr.	Burlingame
Eckstein, Michael L.	Soph. Engr.	Redding
Edden, Francis E.G.	Fr. Engr.	Rockville Centre, New York
Egan, John F.	Soph. Engr.	San Jose
Elam, James M.	Sen. Engr.	San Francisco

Elias, Victor Y.	Soph. B.A.	Basrah, Iraq
Elliott, Michael J.	Jun. A. & S.	Los Gatos
Elmore, Allen M.	Sen. Engr.	Gilroy
Emme, Robert A.	Soph. B.A.	Palo Alto
Engle, Eugene D.	Soph. A. & S.	San Francisco
English, Raymond A.	Ev. B.A.	San Jose
Ennis, John F.	Sen. Engr.	Cedarville
Epley, John W.	Soph. B.A.	Great Falls, Montana
Ernstrom, Philip P.	Soph. B.A.	Portland, Oregon
Esquivel, Ralph F.	Law I	Los Angeles
Estigoy, Romulo J.	Soph. A. & S.	Manila, P. I.
Evans, Oliver T.	Ev. B.A.	San Jose
Evans, W. Hall	Jun. Engr.	Burlingame
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Fagan, Paul M.	Ev. B.A.	San Jose
Fahey, Richard J.	Fr. B.A.	Glendale
Falasco, Dominic	Jun. B.A.	Los Banos
Falasco, Robert M.	Law II	Los Banos
Falge, Roger B.	Soph. A. & S.	Los Gatos
Faller, Miguel	Sen. Engr.	Yucatan, Mexico
Fama, Thomas J.	Jun. B.A.	San Jose
Fanelli, Dominic A.	Sen. B.A.	San Jose
Faraone, Frank R.	Jun. B.A.	San Francisco
Farber, Leopold	Ev. B.A.	San Jose
Farina, Michael J.	Fr. A. & S.	San Jose
Farrell, Charles F.	Soph. Engr.	La Mesa
Farrell, Edward J.	Sen. A. & S.	Sacramento
Farrell, Fred L., Jr.	Jun. B.A.	La Mesa
Farrell, Joseph D.	Jun. B.A.	Sacramento
Fassett, Ralph A.	Sen. Engr.	Sunnyvale
Faugsted, George E., Jr.	Law I	Placerville
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Fawl, Ronald A.	Soph. Engr.	San Jose
Fay, Willard, Jr.	Soph. A. & S.	San Carlos
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Feltz, Eugene E.	Law II	Portland, Oregon
Fennelly, Thomas R.	Sen. A. & S.	Oakland
Fernandez, Gustavo	Fr. A. & S.	Phoenix, Arizona
Ferrante, Armand E.	Sen. A. & S.	San Francisco
Ferrante, David R.	Fr. Engr.	San Francisco
Ferrari, Anthony	Fr. A & S.	Stockton
Ferrari, Robert H.	Sen. B.A.	Willows
Ferreira, Marvin E.	Fr. B.A.	Honolulu, T. H.
Ferris, Frank D.	Fr. Engr.	Fortuna
Filice, Bruno D.	Jun. B.A.	San Jose
Filice, Joseph A., Jr.	Jun. A. & S.	San Jose

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Finocchio, Robert J.	Sen. B.A.	Ross
Fiore, Marcel L., Jr.	Soph. A. & S.	San Francisco
Fioretti, Adriano P.	Jun. Engr.	San Francisco
Fisher, Don	Ev. B.A.	Palo Alto
Fisher, Eugene J.	Sen. Engr.	San Francisco
Fitzgerald, John P.	Ev. B.A.	San Jose
FitzMaurice, Richard W.	Jun. Engr.	Santa Clara
Fitzpatrick, James P.	Soph. Engr.	San Francisco
Fitzpatrick, Patrick C.	Sen. B.A.	Los Angeles
Fitzpatrick, Peter L.	Sen. A. & S.	Los Angeles
Flynn, Clyde F.	Fr. B.A.	San Diego
Flynn, John B.	Fr. Engr.	Ferndale
Flynn, John W.	Fr. Engr.	Sacramento
Foley, John R.	Soph. A. & S.	San Francisco
Ford, Henry A.	Jun. A. & S.	Manila, P. I.
Fore, Millard L.	Soph. B.A.	Lodi
Formico, Marte A.	Jun. A. & S.	Redwood City
Forrest, Carlo C., Jr.	Fr. A. & S.	San Gabriel
Foster, Harold S.	Soph. Engr.	Santa Cruz
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Fraass, Frank W.	Sen. Engr.	Flemington, New Jersey
Franceschini, Robert T.	Soph. A. & S.	Atherton
Francis, Ben C.	Fr. A. & S.	Avenal
Franklin, Matthew J.	Soph. Engr.	Placerville
Frates, Emil F.	Soph. A. & S.	San Jose
Frazer, Raymond R., Jr.	Ev. B.A.	Campbell
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Frediani, Victor J.	Fr. A. & S.	Sacramento
Freitas, Robert B.	Fr. Engr.	Honolulu, T. H.
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Fricke, Ernest E.	Soph. Engr.	San Francisco
Frolli, Richard F.	Soph. A. & S.	Carmel
Frost, Neal F.	Ev. B.A.	San Jose
Fry, Gerald T.	Jun. B.A.	Pacific Grove
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Furtado, Donald T.	Fr. Engr.	Centerville
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Gaffney, James B.	Sen. B. A.	San Francisco
Gagen, Edward H.	Sen. B.A.	San Francisco
Gairaud, Louis M.	Fr. Engr.	San Jose
Galantine, Raymond M.	Fr. Engr.	Santa Clara
Galasso, Maurice	Fr. Engr.	San Jose
Gallagher, George B.	Soph. B.A.	Piedmont
Gallagher, John F., Jr.	Sen. Engr.	Dash Point, Washington
Gardner, William R.	Fr. Engr.	Santa Cruz

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Gehrhardt, Edwin C.	Fr. A. & S.	San Jose
Geiszel, John I.	Jun. A. & S.	Los Gatos
Gemperle, Fritz R.	Sen. Engr.	Quezon City, P. I.
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Geraci, Joseph A.	Ev. B.A.	San Jose
Giammona, Ciro J.	Jun. B.A.	San Jose
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Gilkey, Robert C.	Soph. A. & S.	Berkeley
Gill, James J., Jr.	Jun. A. & S.	Los Gatos
Gillespie, George W.	Ev. B.A.	San Jose
Gillham, Philip C.	Sen. Engr.	San Jose
Gilmour, Donald L.	Law II	San Francisco
Gilshannon, Thomas	Sen. A. & S.	Oakland
Ginney, Jerald W.	Ev. B.A.	San Jose
Gire, Sander O.	Ev. B.A.	San Jose
Girl, Leland S.	Ev. B.A.	Campbell
Gisler, Joseph H.	Jun. B.A.	San Francisco
Giudici, Franco W.	Sen. B.A.	San Rafael
Giusti, Silvio A.	Jun. Engr.	Santa Rosa
Gleason, Robert R.	Sen. B.A.	Trinidad, Colorado
Gleeson, Robert F.	Fr. A. & S.	Chicago, Illinois
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Godoy, Guillermo	Soph. B.A.	Guatemala City, Guatemala
Godoy, Ricardo	Fr. B.A.	Guatemala City, Guatemala
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Gonzalez, Caesar A.	Soph. A. & S.	Los Gatos
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Goodrich, Gordon D.	Ev. B.A.	San Jose
Gordon, Lowell T.	Fr. B.A.	Los Altos
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Gosselin, Robert M.	Sen. B.A.	Tacoma, Washington
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Gourdeau, Daniel A.	Fr. A. & S.	Los Gatos
Graf, John R.	Soph. A. & S.	Winters
Graham, John F.	Jun. A. & S.	Los Gatos
Graham, Robert E.	Jun. Engr.	Menlo Park
Grami, Harry W.	Soph. A. & S.	San Jose
Granstedt, Theodore J.	Fr. Engr.	Sunnyvale
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Green, Frederick J.	Jun. A. & S.	Los Gatos
Greenbach, Joseph	Sen. B.A.	Atherton
Greene, George A.	Sen. Engr.	San Jose

Greene, John E.	Jun. B.A.	Portland, Oregon
Gregory, Marvin L.	Fr. Engr.	Lawndale
Griffin, Robert E.	Fr. A. & S.	Los Gatos
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Gross, Emeline K.	Ev. B.A.	San Jose
Guardia, Gilberto J.	Sen. Engr.	Panama, Panama
Guedet, Paul F.	Jun. A. & S.	San Francisco
Guerin, Thomas A.	Jun. B.A.	San Francisco
Guimoye, Jose F.	Fr. A. & S.	Los Angeles
Guizar, Carlos H.	Sen. Engr.	Chihuahua, Mexico
Gurries, Robert H.	Jun. Engr.	San Jose
Gutierrez, Roberto A.	Jun. Engr.	Tiajuana, Mexico
Haack, William C.	Soph. B.A.	San Francisco
Haas, Robert M.	Ev. B.A.	San Jose
Hagan, Edward W.	Sen. B.A.	Tucson, Arizona
Hage, Richard H.	Ev. B.A.	San Jose
Haight, Robert P.	Jun. A. & S.	San Jose
Hakeem, Gus P.	Jun. A. & S.	Stockton
Hakeem, Harvey M.	Law III	Stockton
Hale, Garvin W.	Law III	Protection, Kansas
Haley, Robert E.	Law I	Salinas
Haley, William C.	Soph. B.A.	San Anselmo
Hall, Ferdinand A.	Fr. Engr.	Redwood City
Hall, Joseph A.	Fr. B.A.	San Jose
Haller, Leroy B.	Ev. B.A.	Cupertino
Hammond, John M.	Fr. A. & S.	San Marino
Hamre, Henry N.	Ev. B.A.	Santa Clara
Hanrahan, Thomas G.	Soph. A. & S.	Los Gatos
Hanratty, James P.	Law II	Dunsmuir
Hanretty, James L.	Jun. A. & S.	Napa
Hansen, Margaret H.	Ev. B.A.	San Jose
Hansen, Ronald G.	Soph. Engr.	Oahu, T. H.
Harbert, Raymond C.	Sen. Engr.	Los Angeles
Hardin, Harvey E.	Ev. B.A.	Campbell
Hardy, James P.	Sen. A. & S.	Sacramento
Hare, Francis W.	Soph. A. & S.	Spokane, Washington
Harrigan, Louis F.	Fr. Engr.	Stockton
Harrington, Andrew M.	Jun. A. & S.	Boise, Idaho
Harrington, Gerald E.	Ev. B.A.	Santa Clara
Harrison, Betty J.	Ev. B.A.	Santa Clara
Hatch, Oliver L.	Law I	Martinez
Hausmann, William C.	Sen. A. & S.	Everett, Washington
Hawkins, Walter J., Jr.	Soph. B.A.	Nevada City, California
Hayes, Philip F.	Soph. B.A.	Santa Clara
Haynes, Hall G.	Sen. A. & S.	Pasadena
Heafey, Edwin A., Jr.	Soph. A. & S.	Oakland
Healey, John B.	Soph. A. & S.	San Jose
Heffernan, Carroll A.	Soph. A. & S.	Porterville

Heffernan, Frank M., Jr.	Soph. A. & S.	San Francisco
Hegarty, Daniel M.	Fr. Engr.	Belmont
Heier, Loyal J.	Sen. B.A.	Marysville
Heintz, Walter G.	Sen. Engr.	San Jose
Heisel, Richard L.	Fr. B.A.	Belmont
Helfrich, Francis E.	Jun. B.A.	Menlo Park
Helfrich, Philip	Jun. A. & S.	Menlo Park
Hemker, Thomas A.	Fr. Engr.	Sandusky, Ohio
Hempler, Fred P.	Ev. B.A.	San Jose
Henderson, Paul D.	Sen. B.A.	Santa Rosa
Henderson, Robert M.	Soph. B.A.	Sacramento
Henderson, William S.	Fr. B.A.	Sacramento
Heney, Frederick J.	Fr. A. & S.	Los Gatos
Hennessy, Jeremiah J.	Sen. B.A.	Los Angeles
Hennessy, Michael A.	Fr. A. & S.	Los Angeles
Hentschell, Patrick C.	Soph. A. & S.	Seattle, Washington
Hentschell, Robert B.	Jun. A. & S.	Kirkwood, Missouri
Herb, John J.	Soph. Engr.	Vancouver, Canada
Herber, John C.	Fr. B.A.	Port Blakely, Washington
Hernandez, Daniel A.	Law I	San Jose
Higgins, James G.	Soph. B.A.	Sacramento
Hirth, Walter F.	Sen. Engr.	Richmond
Hock, John J.	Sen. A. & S.	Los Angeles
Hoedt, Richard F.	Soph. A. & S.	San Francisco
Hofmann, Bernard T.	Soph. A. & S.	San Jose
Holeman, George S.	Sen. A. & S.	Boulder Creek
Holm, Paul B.	Sen. A. & S.	San Francisco
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Holmes, Jack H.	Sen. Engr.	Palermo
Holt, Frank W.	Jun. B.A.	Concord
Hombach, Leo J.	Fr. A. & S.	Los Gatos
Honzel, Andrew J.	Fr. B.A.	Klamath Falls, Oregon
Hopkins, David P.	Jun. Engr.	Watsonville
Hoque, Herbert V.	Ev. B.A.	Santa Clara
Horton, Ben L.	Law I	Lodi
Horton, Philip G.	Soph. B.A.	Medford, Oregon
House, George C.	Sen. A. & S.	Milpitas
Howsley, Earl T.	Sen. B.A.	Sacramento
Hsu, Leonard Y. G.	Fr. A. & S.	Shanghai, China
Hughes, Ralph O.	Sen. Engr.	Sacramento
Hunt, William J.	Jun. Engr.	San Mateo
Hurley, Dean J.	Fr. A. & S.	Bakersfield
Hurley, James J.	Sen. B.A.	Seattle, Washington
Huttlinger, Daniel C.	Soph. Engr.	Los Altos
Hutton, William D.	Ev. B.A.	San Jose
Hyde, Leo B.	Soph. A. & S.	Los Gatos
Hygelund, Lloyd	Ev. B.A.	San Jose

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Iden, Donnell D.	Jun. A. & S.	Marysville
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Ingber, Philip H.	Sen. A. & S.	San Mateo
Ingraham, Norman P.	Sen. Engr.	Portsmouth, New Hampshire
Inouye, Mamoru	Soph. Engr.	Los Gatos
Isnard, John R.	Jun. B.A.	Ukiah
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Jacobs, Donovan W.	Ev. B.A.	Pacific Palisades
Jacobs, Robert F.	Law II	San Mateo
Jacobs, Robert N.	Law II	San Mateo
Janda, Anton R.	Fr. Engr.	Carmel
Javete, Donald F.	Jun. Engr.	Berkeley
Jay, Robert F.	Soph. A. & S.	Los Gatos
Jeffry, John J.	Soph. A. & S.	Concord
Jelesko, Anton F.	Sen. Engr.	Cupertino
Jirgal, Robert M.	Ev. B.A.	Santa Clara
John, Richard L.	Sen. B.A.	San Francisco
Johnson, Donald D.	Sen. Engr.	Belmont
Johnson, Philip L.	Soph. Engr.	San Jose
Johnson, Warren C.	Jun. A. & S.	Carmel
Johnston, Don F.	Soph. B.A.	Hollister
Johnston, Faber L., Jr.	Law III	San Jose
Johnston, Lawrence P.	Jun. B.A.	Menlo Park
Johnstone, William D.	Soph. Engr.	South Pasadena
Jones, Daniel C.	Ev. B.A.	San Jose
Jones, Donlan F.	Soph. Engr.	San Francisco
Jones, Florence M.	Ev. B.A.	San Jose
Jones, James W.	Ev. B.A.	Santa Clara
Jones, Leo H.	Ev. B.A.	San Mateo
Josephson, Leigh D., Jr.	Soph. A. & S.	San Jose
Joyce, Thomas F.	Fr. B.A.	Santa Clara
Justice, John A.	Soph. A. & S.	Los Angeles
Kahn, Julius, III	Fr. A. & S.	San Mateo
Kakos, Steve G.	Ev. B.A.	San Jose
Kalahui, Anthony V.	Sen. B.A.	Honolulu, T. H.
Kane, Donald E.	Sen. Engr.	San Francisco
Kane, John W.	Sen. B.A.	Watsonville
Kane, Paul D.	Fr. B.A.	Watsonville
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Karcher, Herbert J.	Ev. B.A.	San Jose
Kearley, Carroll C.	Soph. A. & S.	Wendell, Idaho
Kearns, James F.	Fr. B.A.	Redwood City
Keating, Carroll J.	Fr. A. & S.	Los Gatos

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Keefe, John H., Jr.	Sen. B.A.	San Francisco
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Kelly, Joseph M.	Sen. B.A.	Chicago, Illinois
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Kennedy, Richard J.	Soph. A. & S.	Los Angeles
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Kenny, William R.	Jun. A. & S.	Palo Alto
Kerckhoff, Anton W.	Jun. A. & S.	Covina
Kerfoot, Lester R., Jr.	Jun. A. & S.	Walnut Creek
Kerwin, Thomas J.	Soph. A. & S.	Oak Park, Illinois
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Kiely, Denis J.	Soph. Engr.	San Jose
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Kilkenny, Robert G.	Fr. B.A.	Dixon
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Knoop, Louis H.	Jun. A. & S.	Los Angeles
Koch, Monte C.	Ev. B.A.	Campbell
Koch, Terrence E.	Soph. A. & S.	Los Gatos
Kong, Vivian F.	Fr. Engr.	Maui, T.H.
Korte, Norbert, Jr.	Soph. A. & S.	Oakland
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Kraemer, Gilbert U.	Fr. B.A.	Placentia
Kraljev, Peter J.	Sen. Engr.	Sacramento
Kretzmer, John J.	Soph. Engr.	San Francisco
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Kump, Charles G.	Fr. Engr.	San Mateo
Kustel, Harvey H.	Ev. B.A.	San Jose

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LaBrie, Maurice F.	Ev. B.A.	Stanford
LaFranchi, Edward A.	Sen. Engr.	Nicasio
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Lagomarsino, James E.	Fr. A. & S.	Sacramento
Lagomarsino, Louis B.	Sen. B.A.	Sacramento
Lai, Walter S. Y.	Fr. A. & S.	Honolulu, T. H.
Lambert, Robert E.	Sen. B.A.	Willows
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Lane, John C., Jr.	Fr. Engr.	Oakland
Lane, Thomas L.	Soph. A. & S.	Petaluma
Lang, Louis E.	Soph. A. & S.	San Francisco
Lanza, Frank C.	Fr. A. & S.	San Mateo
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Larkin, M. Michael	Fr. A. & S.	Wilton
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Laxalt, Peter D.	Soph. A. & S.	Carson City, Nevada
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Leitao, Vasco A.	Jun. B.A.	Shanghai, China
Lemke, William J.	Jun. B.A.	Honolulu, T. H.
LeMoss, James D.	Soph. B.A.	Healdsburg
Lentz, Gerald J.	Soph. A. & S.	Los Gatos
Leonetti, Alfred M.	Sen. A. & S.	San Martin
Leonhardt, Charles F.	Fr. Engr.	San Francisco
Letcher, Thomas C.	Ev. B.A.	Santa Clara
Lettunich, Martin M.	Jun. B.A.	Watsonville
Levaggi, Dario A.	Fr. A. & S.	Oakland
Lewis, Melvin B.	Fr. A. & S.	San Mateo
Lewis, Monte R.	Jun. B.A.	Santa Clara
Lewis, Peter B.	Soph. Engr.	Los Altos
Lewis, William J.	Ev. B.A.	San Jose
Lico, Frank M.	Soph. A. & S.	San Jose
Liefgreen, Daniel J.	Sen. B.A.	Phoenix, Arizona
Lillo, Antonio L.	Ev. B.A.	San Jose

Lindegren, Jack K.	Fr. A. & S.	Fresno
Lindgren, Jean E.	Ev. B.A.	San Jose
Lindquist, James J.	Fr. Engr.	Hayward
Lobo, Pedro H.	Jun. B.A.	Hongkong, China
Locke, Frank E.	Soph. Engr.	Long Beach
Logan, Fred J.	Ev. B.A.	Sunnyvale
London, John A.	Law II	Santa Clara
Long, Albert R.	Fr. A. & S.	Santa Clara
Long, Raymond A., Jr.	Soph. Engr.	Santa Clara
Longinotti, Joseph M.	Soph. B.A.	San Mateo
Longwell, Douglas R.	Fr. A. & S.	Palo Alto
Lopez, Louis P.	Soph. Engr.	Vallejo
Lorentz, John A.	Law II	Oregon City, Oregon
Louis, Duane J.	Fr. A. & S.	Alameda
Love, James H.	Fr. B.A.	Millbrae
Low, Andrew F.	Jun. Engr.	San Francisco
Lucas, Louis B.	Fr. A. & S.	San Jose
Lucena, John J.	Fr. A. & S.	Chico
Luis, Thomas S.	Jun. A. & S.	Honolulu, T. H.
Luzzi, Robert E.	Fr. A. & S.	Healdsburg
Lynch, Eugene F.	Fr. A. & S.	San Francisco
Lynch, Philip B.	Sen. A. & S.	Vallejo
Lynch, Walter G.	Fr. A. & S.	Tacoma, Washington
Lynn, Robert J.	Jun. B.A.	Watsonville
Lyons, Donald C.	Soph. A. & S.	Santa Cruz
Lyons ,Thomas J.	Sen. A. & S.	Santa Clara
McAbee, Donald O.	Fr. Engr.	San Jose
McAnulty, John D.	Jun. A. & S.	Los Gatos
McAteer, James F.	Soph. A. & S.	Seattle, Washington
McCaffrey, James L.	Jun. A. & S.	Los Gatos
McCall, Richard D.	Jun. A. & S.	Los Altos
McCargar, Joseph V.	Fr. A. & S.	Los Angeles
McCarthy, Frank J., Jr.	Sen. Engr.	Campbell
McCarthy, John L.	Soph. A. & S.	Watsonville
McClellen, John E.	Fr. B.A.	San Bruno
McConville, Mark R.	Soph. A. & S.	Los Gatos
McCormick, John J.	Ev. B.A.	San Jose
McCormick, Virgil F., Jr.	Jun. B.A.	Sacramento
McCrystle, Charles W.	Fr. A. & S.	Los Gatos
McCullough, Robert F.	Soph. B.A.	San Francisco
McDermott, Thomas J.	Soph. B.A.	Hayward
McDevitt, Robert L.	Soph. A. & S.	Los Gatos
McDiarmid, William G.	Law III	San Jose
McDonald, Angus R.	Fr. A. & S.	Los Gatos
McDonough, Robert F.	Jun. A. & S.	Los Gatos
McElhinney, Frank D., Jr.	Fr. B.A.	Alameda
McEnaney, Francis A.	Fr. A. & S.	Redding
McEvoy, Richard W.	Soph. B.A.	Petaluma

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McGlynn, Mark H.	Ev. B.A.	Campbell
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McMahon, John W.	Fr. B.A.	Butte, Montana
McNally, Daniel J.	Fr. A. & S.	Tacoma, Washington
McNamara, James A.	Fr. A. & S.	Santa Barbara
McNamara, John T.	Fr. B.A.	Merced
McNamara, Patrick H.	Jun. A. & S.	Merced
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McPhee, Charles B.	Sen. A. & S.	Menlo Park
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MacDonald, David W.	Fr. A. & S.	Los Gatos
MacDonald, Donald F.	Jun. A. & S.	San Jose
MacGregor, Gregor D.	Ev. B.A.	San Jose
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MacIntyre, Kenneth R.	Fr. B.A.	Burley, Idaho
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Maloney, James V.	Sen. B.A.	San Francisco
Maloney, John A.	Fr. A. & S.	Sayre, Pennsylvania
Maloney, John W.	Soph. A. & S.	Santa Barbara
Maloney, Richard E.	Soph. A. & S.	Oakland
Maloney, Robert L.	Fr. A. & S.	Los Gatos
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Manning, Robert D.	Soph. Engr.	San Mateo
Marasti, Jack R.	Jun. B.A.	Merced

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Marsella, Gary E.	Fr. A. & S.	Fresno
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Martin, John D.	Fr. A. & S.	Eureka, Nevada
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Mathis, Raymond L.	Ev. B.A.	Saratoga
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Matthews, John G.	Sen. B.A.	Carpenteria
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Maus, Frank B.	Soph. Engr.	Petaluma
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Mayhew, Herbert F.	Ev. B. A.	San Jose
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Medina, Jaime G.	Jun. Engr.	Panama, Panama
Meechan, Francis P.	Fr. B.A.	Payette, Idaho
Meeken, Michael C.	Fr. B.A.	Burlingame
Melia, Joseph W.	Fr. B.A.	Seattle, Washington
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Micheletti, Manlio J.	Fr. B.A.	San Mateo
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Milani, Douglas P.	Sen. A. & S.	Mt. View
Miles, Aurelius B.	Law I	Chicago, Illinois

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Miller, Henry W.	Sen. Engr.	Palo Alto
Miller, Joseph P.	Fr. A. & S.	San Jose
Miller, Paul E., Jr.	Soph. A. & S.	Portland, Oregon
Miller, Robert R.	Fr. A. & S.	Aberdeen, Washington
Mills, Albert	Fr. A. & S.	San Luis Obispo
Mills, William D.	Fr. B.A.	Santa Rosa
Minnerly, Clarence E., Jr.	Jun. B.A.	Visalia
Miser, Arthur	Sen. Engr.	San Jose
Mitchell, Edwin F.	Ev. B.A.	San Jose
Mitchell, John C.	Soph. Engr.	Hayward
Mladenka, George J., Jr.	Fr. A. & S.	Belmont
Moberg, Ronald L.	Fr. B.A.	San Francisco
Mollard, Thomas A., Jr.	Sen. Engr.	Oakland
Monacell, Cornelius J.	Jun. A. & S.	Los Gatos
Monaghan, Robert D.	Jun. A. & S.	Tacoma, Washington
Monahan, Eugene R.	Jun. Engr.	San Jose
Monahan, Michael A.	Soph. A. & S.	Carmel
Mondon, Richard M.	Fr. A. & S.	Palo Alto
Monroe, Joseph W.	Sen. Engr.	Glendora
Monroe, Robert E.	Fr. B.A.	Glendora
Montandon, William C.	Fr. Engr.	San Jose
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Moore, Edwin J.	Law I	Santa Clara
Moore, Logan, Jr.	Law II	Redwood City
Moore, Thomas J.	Law III	Portland, Oregon
Morales, Frank F.	Fr. B.A.	Ensenada, B. C., Mexico
Moran, Benjamin R., Jr.	Jun. A. & S.	Van Nuys
Moran, Neil V.	Soph. B.A.	Lafayette
Moreno, Jose H.	Law II	Santa Clara
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Morris, John C.	Soph. A. & S.	Los Gatos
Morris, Joseph W.	Jun. A. & S.	Los Gatos
Morrissey, Catherine M.	Ev. B.A.	San Jose
Morse, Timothy J.	Soph. A. & S.	Gilroy
Mullaney, Thomas A.	Jun. Engr.	San Francisco
Mullin, Harold J.	Fr. A. & S.	San Francisco
Munoz, Robert M.	Fr. A. & S.	San Jose
Murphy, Edward M.	Fr. A. & S.	Portland, Oregon
Murphy, George E., Jr.	Sen. A. & S.	Nevada City, California
Murphy, Patrick E.	Sen. Engr.	Portland, Oregon
Murphy, Paul C.	Fr. B.A.	San Carlos
Murphy, Peter N.	Soph. B.A.	McCloud
Murphy, Timothy P., Jr.	Sen. Engr.	San Jose
Murphy, William F.	Fr. A. & S.	San Mateo
Murrell, Richard N.	Ev. B.A.	Santa Clara
Musante, Angelo J.	Soph. A. & S.	Los Gatos

Musante, George R.	Jun. B.A.	San Jose
Mylod, John L.	Jun. A. & S.	Atherton
Naccarato, Mauro	Jun. A. & S.	Hollister
Nagler, Robert G.	Fr. A. & S.	Marysville
Nailen, Richard L.	Sen. Engr.	San Jose
Nally, Joseph T.	Sen. B.A.	Los Angeles
Nalty, John E.	Jun. A. & S.	Denver, Colorado
Nancarrow, Henry E.	Ev. B.A.	San Jose
Napoli, Richard H.	Ev. B.A.	San Jose
Napolitano, Leonard M.	Jun. A. & S.	Oakland
Nard, Robert I.	Jun. A. & S.	San Francisco
Nardi, Peter M.	Ev. B.A.	San Jose
Nardinelli, Kenneth E.	Fr. B.A.	Woodland
Neary, George H.	Jun. A. & S.	Los Altos
Nellis, Richard B.	Fr. B.A.	Germantown, Tennessee
Nemier, Maurice J.	Ev. B.A.	San Jose
Nichols, John L.	Jun. A. & S.	San Francisco
Nickerson, Paul C.	Fr. Engr.	Salt Lake City, Utah
Niehaus, Donald L.	Sen. B.A.	Spokane, Washington
Nock, Richard L.	Fr. A. & S.	Cambria
Nola, Vincent F.	Fr. A. & S.	San Jose
Nolan, Donald A.	Jun. B.A.	San Francisco
Nolte, Leo J.	Fr. Engr.	Los Angeles
Norquist, Galen R.	Sen. B.A.	Boise, Idaho
Norton, Leal F.	Soph. A. & S.	Sacramento
Novakovich, John P.	Ev. B.A.	Santa Clara
Nulk, Charles E.	Jun. B.A.	Vacaville
Nunes, Frank R.	Fr. B.A.	Salinas
Nunn, Harold D.	Soph. Engr.	Agnew
Nutini, Roy E.	Soph. B.A.	Soquel
Nyland, Harvey S.	Soph. A. & S.	San Juan Bautista
O'Banion, Ernest L.	Sen. A. & S.	Oakland
O'Berst, Gordon C.	Soph. A. & S.	San Francisco
O'Brien, Edward P.	Fr. A. & S.	San Mateo
O'Brien, John H.	Soph. A. & S.	Hollister
O'Brien, Marshall S.	Jun. A. & S.	San Jose
O'Brien, Samuel D.	Law II	San Jose
O'Brien, William R.	Jun. Engr.	San Francisco
O'Connor, Donald L.	Fr. A. & S.	Richmond
O'Connor, Thomas P.	Ev. B.A.	Santa Clara
O'Hanlon, James B.	Law I	Portland, Oregon
O'Hare, Homer J.	Soph. Engr.	Oakland
O'Hollaren, Paul J.	Sen. B.A.	Portland, Oregon
Okamoto, Robert Y.	Fr. Engr.	Los Gatos
O'Keefe, Neil L.	Jun. Engr.	San Diego
O'Keeffe, David E.	Fr. B.A.	San Jose
O'Keeffe, John M., Jr.	Sen. B.A.	San Jose

O'Leary, Thomas F.	Soph. A. & S.	San Anselmo
O'Leary, William T.	Sen. Engr.	Oakland
Oliver, Anthony T.	Jun. A. & S.	San Jose
Olmsted, Burton L.	Ev. B.A.	Sunnyvale
Olson, Charles R.	Fr. Engr.	San Bruno
O'Neil, Raymond K.	Fr. Engr.	Stockton
O'Neill, James C.	Sen. A. & S.	San Francisco
O'Neill, Joseph E., Jr.	Jun. A. & S.	San Francisco
O'Reilly, Thomas B.	Law I	Shelter Island, New York
Ornelas, Richard	Fr. B.A.	Los Angeles
Osborn, Maurice K.	Sen. A. & S.	Pasadena
O'Sullivan, Michael R.	Fr. Engr.	Los Angeles
Otis, Robert J.	Sen. Engr.	Los Angeles
Ott, John F.	Jun. A. & S.	Los Angeles
Owen, Richard A.	Ev. B.A.	Santa Clara
Padden, Stanley J.	Soph. A. & S.	Seattle, Washington
Page, Louis J.	Sen. B.A.	Philadelphia, Mississippi
Pagendarm, Harold C.	Jun. Engr.	Oakland
Painter, Benjamin S.	Sen. Engr.	San Jose
Pakele, Clayton P.	Jun. Engr.	Hilo, T. H.
Panelli, Edward A.	Fr. A. & S.	Santa Clara
Panelli, Pilade A.	Ev. B.A.	Santa Clara
Paoa, Eugene B.	Fr. B.A.	Honolulu, T. H.
Parker, Joseph E., Jr.	Sen. B.A.	Butte, Montana
Parker, Joseph R.	Soph. A. & S.	Glendale
Parkhurst, John F.	Soph. A. & S.	Pasadena
Pasco, John S.	Soph. A. & S.	Chicago, Illinois
Pasetta, Richard M.	Fr. Engr.	San Jose
Passadori, Gerald L.	Soph. B.A.	Atwater
Passalacqua, Emil R.	Fr. A. & S.	Healdsburg
Passalacqua, John L.	Sen. A. & S.	Healdsburg
Patnaude, Roy D.	Law I	Oregon City, Oregon
Patten, Francis E.	Ev. B.A.	Santa Clara
Patterson, Curtis	Jun. B.A.	Manteca
Patton, Philip A.	Sen. A. & S.	Vallejo
Paull, William R., Jr.	Soph. Engr.	Salinas
Pavlina, Milton N.	Fr. A. & S.	Mountain View
Payne, Thomas J.	Sen. A. & S.	Tacoma, Washington
Payne, William E.	Fr. A. & S.	Tacoma, Washington
Paz, John, Jr.	Ev. B.A.	Santa Clara
Pearce, James F.	Jun. Engr.	Santa Clara
Pearman, Noel E.	Soph. B.A.	San Jose
Peinado, Luis A.	Soph. A. & S.	Los Gatos
Peixoto, Marvin A.	Soph. A. & S.	Irvington
Pelliccione, Paul F.	Jun. B.A.	Gilroy
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Pendergraft, Charles L.	Ev. B.A.	San Jose
Perez, Francis J.	Jun. A. & S.	San Jose

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Perrucci, Clement A.	Sen. A. & S.	San Jose
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Perry, James F.	Fr. A. & S.	Salinas
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Peters, Robert H.	Soph. A. & S.	San Francisco
Peterson, Charles J.	Soph. B.A.	San Mateo
Peterson, Richard D.	Ev. B.A.	San Jose
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Plat, Richard V.	Jun. Engr.	San Jose
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Porterfield, Alan R.	Soph. A. & S.	Fort Bragg
Potoc, George N.	Soph. B.A.	Los Gatos
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Pritchard, Francis X.	Sen. A. & S.	Santa Clara
Pritchard, Keith F.	Sen. A. & S.	Campbell
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Quigley, William T.	Ev. B.A.	Campbell
Quilici, Adolph M.	Soph. Engr.	San Jose
Quinn, Albert S.	Fr. Engr.	Seattle, Washington
Quinn, Irwin T., Jr.	Sen. A. & S.	Eureka
Quinn, John L.	Fr. B.A.	Eureka
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Ratliff, Robert L.	Fr. A. & S.	San Jose
Rauscher, Paul H.	Ev. B.A.	Santa Clara
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Re, John A.	Soph. B.A.	San Jose
Re, Sam J.	Sen. A. & S.	San Jose
Read, Roderick J. M.	Jun. B.A.	Sacramento
Redig, Roger L.	Soph. A. & S.	Burlingame
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Regan, John L.	Sen. B.A.	Oakland
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Reinheimer, Frederick S.	Spec. B.A.	Rochester, New York
Resetar, William M.	Sen. B.A.	Watsonville
Revel, Paul J.	Ev. B.A.	San Jose
Revetagat, Eugene E.	Sen. Engr.	San Jose
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Reynolds, Joseph V., Jr.	Soph. Engr.	Los Angeles
Reynolds, Rex V. E.	Fr. A. & S.	Los Gatos
Rice, William J.	Fr. Engr.	Lincoln, Nebraska
Richley, Ralph P.	Soph. B.A.	Los Angeles
Riddle, Floyd G.	Ev. B.A.	San Jose
Riddle, William C.	Soph. B.A.	Gilchrist, Oregon
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Risko, William J.	Fr. A. & S.	Hurley, Wisconsin
Riveroll, Elinor M.	Ev. B.A.	San Jose
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Roache, William D.	Jun. A. & S.	Los Gatos
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Rocca, James V.	Fr. Engr.	San Francisco
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Rock, Martin I.	Jun. A. & S.	Los Gatos
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Rogers, Francis P.	Fr. B.A.	Seattle, Washington
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Rolfs, Richard W.	Fr. A. & S.	Los Gatos
Roman, William	Jun. Engr.	Geyserville
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Rooney, Francis L.	Sen. B.A.	Sacramento

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Roswall, Richard	Soph. B.A.	San Jose
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Royer, William H.	Ev. B.A.	Redwood City
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Rudolph, Louis R.	Jun. A. & S.	Pacific Grove
Ruiz, Ignacio, Jr.	Jun. Engr.	San Francisco
Ruso, Francis J.	Jun. B.A.	Watsonville
Russell, John R.	Jun. A. & S.	San Diego
Rustum, Sargon E.	Soph. Engr.	Baghdad, Iraq
Ryan, Francis X.	Fr. A. & S.	Los Gatos
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